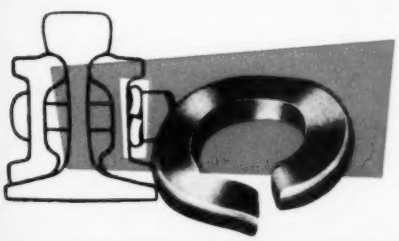
RAILWAY TRACK and STRUCTURES

April 1956

One of Five Specialized Railway Age Publications



IMPROVED HIPOWERS
IMPROVE TRACK

Maintenance costs are reduced when sufficient power and pressure hold joints and track so strongly that less frequent tightening is required.

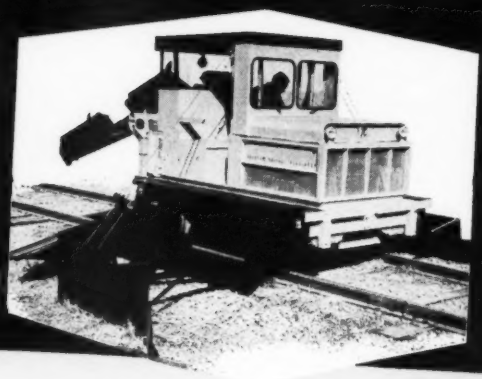
Our immensely powerful spring washers do that — and they have been doing it for years and years over thousands and thousands of miles of tracks.

THE NATIONAL LOCK WASHER COMPANY, NEWARK 5, N. J., U. S. A.

A COMPLETE LINE OF RAILWAY SPRING WASHERS

Kershaw
Ballast Regulator

PROVEN...



. . . on America's Leading Railroads!

-HONOR ROLL-

The Kershaw Ballast Regulator, Scarifier and Plow Has Been Purchased by the Following Railroads and Contractors in the Indicated Quantities:

Algoma Central and Hudson Bay Railway Company
Ann Arbor Railroad Company
*Atchison, Topeka and Santa Fe Railway Company
Atlanta & Saint Andrews Bay Railway Company
**Atlantic Coast Line Railroad
***Baltimore and Ohio Railroad Company, The
Bailes and Sey Construction Company
Bessemer and Lake Erie Railroad Company
Birmingham Southern Railroad Company
*Boston and Maine Railroad
*Estrada De Ferro - Central Do Brazil
Rio De Janerio, Brazil
****Canadian National Railways
**Canadian Pacific Railway Company
Carolina and Northwestern Railway Company
**Central of Georgia Railway Company
Central Railroad of New Jersey, The
Charleston and Western Carolina Railway Company
***Chesapeake and Ohio Railway Company, The
*Chicago and Eastern Illinois Railroad Company
*Chicago and Northwestern Railway Company
Chicago Great Western Railway Company
**Chicago, Milwaukee, St. Paul and Pacific Railroad Company
*Chicago, Rock Island and Pacific Railroad Company
Chicago, St. Paul, Minneapolis and Omaha Railway Company
*Clinchfield Railroad Company
Consolidated Railroads of Cuba
*Delaware and Hudson Railroad Corporation
*Delaware, Lackawanna & Western Railroad Company, The
Denver and Rio Grande Western Railroad Company, The
Detroit and Mackinac Railway Company
*Detroit, Toledo and Ironton Railroad Company
Duluth, South Shore and Atlantic Railroad Company
Elgin, Joliet and Eastern Railway Company
Erie Railroad Company
Ferguson & Edmondson Company
Great Northern Railway Company
*Gulf, Mobile and Ohio Railroad Company
Interstate Railroad Company
*Lehigh Valley Railroad Company
Louisiana Midland Railway Company
*****Louisville and Nashville Railroad Company
*Mannix Construction Company, Ltd.
Minneapolis and St. Louis Railway Company
*Missouri-Kansas-Texas Lines
*Nashville, Chattanooga & St. Louis Railway, The
*New York, Chicago & St. Louis Railroad Company, The
*New York, New Haven & Hartford Railroad Company, The
*W. H. Nichols, Inc.
*****Pennsylvania Railroad, The
Phelps Dodge Corporation
L. E. Pilot and Son Construction Company
*Reading Company
Richmond, Fredericksburg and Potomac Railroad Company
*Royce Kershaw Company, Inc.
*****Seaboard Air Lines Railroad Company
**St. Louis - San Francisco Railway Company
St. Louis - Southwestern Railway Company
*T. F. Scholes, Inc., Reading Pa.
*W. A. Smith Contracting Company
*****Southern Railway System
**Southern Pacific Company
*Texas and New Orleans Railroad Company
*Texas and Pacific Railway Company, The
Toledo, Peoria and Western Railroad Company
Union Railroad Company
*United Plastics Limited (Industrial Construction Company)
*Wabash Railroad Company
*Western Maryland Railway Company
Western Pacific Railroad Company
A. S. Wilkstrom, Inc.

*2 to 5 Machines
**6 to 10 Machines
***11 to 20 Machines
****21 to 30 Machines
*****31 to 40 Machines

RECOGNIZE THIS SYMBOL OF LEADERSHIP

KERSHAW MANUFACTURING CO. INC
MONTGOMERY (K) ALABAMA

Why this switch stand is outstanding

The New Century switch stand looks pretty much like many other stands. Yet there's a world of difference! Just what makes the New Century stand out?

The answer is a simple matter of economy. An economy that begins with the low initial cost and stretches far beyond.

First, the ease of switch-point adjustment, which is a built-in feature of the stand itself. By simply removing or adding a shim or two you increase or decrease the length of throw. The shims are furnished with each stand and stored inside the housing. Surely much quicker and less expensive than adjustments made at the points.

This adjustment feature, in turn, reduces wear on such switch fittings as throw rods and switch rods, resulting in longer life and further economy.

Another important advantage of the New Century is the interchangeability of parts. When one of the parts finally needs replacing, you'll find that new parts will fit the oldest New Centuries on your lines. And this, despite a number of improvements made in the stand's design during the past fifty years.

You will find, too, that a New Century will outlive several switches, and is easily moved from main line to yard or siding service. It can be readily converted from intermediate to low and back again, according to service requirements. One of our engineers will gladly demonstrate the New Century in full detail, at any time you say.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM STEEL

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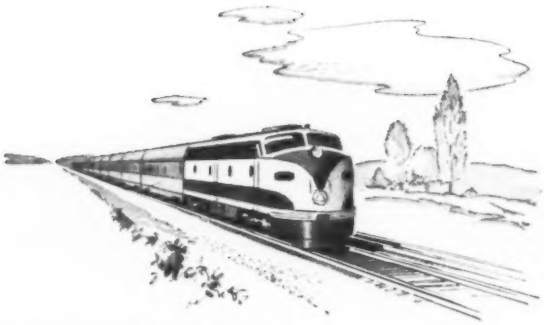
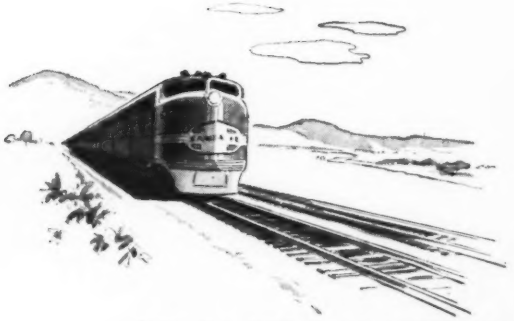


Richmond, Fredericksburg & Potomac's crack diesel outside Richmond, Virginia.



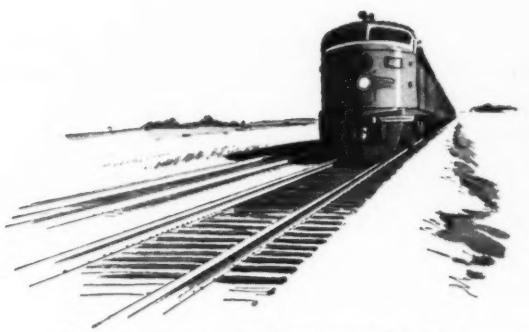
Santa Fe's "Chicagoan" eastbound between Cedar Point and Clements, Kansas.

Ribbonrail Service

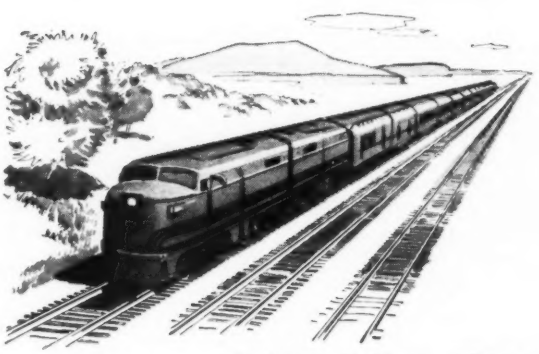
for open track high-speed traffic

Did you know that RIBBONRAIL Service is now producing miles of pressure-welded continuous rail for use in open main track? A few years ago continuous welded rail was used mostly in special locations such as bridges, station platforms, tunnels, and crossings. Cost-cutting performance of long rail in those locations prompted railroads to lay small "experimental" lengths in open track. These installations have proved their value. Now hundreds of miles of continuous rail — produced by RIBBONRAIL Service — are saving thousands of maintenance dollars for the railroads. Illustrated are just a few locations where RIBBONRAIL Service has made it possible for passenger and freight trains to glide smoothly over continuous rail many times a day.

Send for the booklet "Progress in Rail Pressure-Welding" for more information.



Chicago & North Western's "Gold Coast" between Missouri Valley and Council Bluffs, Iowa.



Lehigh Valley's "Black Diamond" at Royce, New Jersey.

RAILROAD DEPARTMENT
Linde Air Products Company
A Division of Union Carbide and Carbon Corporation
30 East 42nd Street UCC New York 17, N. Y.
Offices in Other Principal Cities
In Canada: LINDE AIR PRODUCTS COMPANY
Division of Union Carbide Canada Limited, Toronto

The term "Ribbonrail" is a service mark of Union Carbide and Carbon Corporation.

Nalco Spray Cars give precise dosage and coverage. Available without charge to users of tank car lots of Nalco Chemicals.

10 POSITIVE *Nalco* WAYS

for ALL-SEASON WEED and BRUSH CONTROL

● Whatever your particular weed, grass or brush control problem — Nalco has the safe, sure answer in this complete selection of proved chemical treatments . . . *10 in all.*

Nalco also assures the most *economical* application possible . . . with mechanical spreaders and shaker boxes for small and hard-to-reach areas . . . with various sized drums, and tank car lots for use in modern Nalco Spray Cars.

Right now is the time to start your full-season weed control program with Nalco Chemicals. Ask for full facts on scheduling and prices.

CHEMICAL	DOSAGE	APPLICATION	SHIPPED
1 Nalco H-170 Weed Control	One gal. per 1000 sq. ft.	After predominant weeds emerge.	Tank cars and 54 gal. drums.
2 Nalco H-1708 Weed and Grass Control	One gallon per 4500 sq. ft. with one gal. H-170 per 1500 sq. ft.	After predominant grasses emerge. Use in combination with Nalco H-170.	Tank cars.
3 Nalco H-174 Weed and Grass Control	200 to 400 lbs. per acre.	Best applied in early spring or just before rainy season.	100 lb. drums and 3½ lb. shaker boxes.
4 Nalco H-175 Dormant Brush Control	Dilute 10 gal. with 90 gal. diesel oil, etc. Use 25 to 40 gal. per acre.	Thoroughly wet basal area of plant.	54 gal. drums.
5 Nalco H-176 Brush Control	Dilute one gal. to 135 gal. of water. Use 100 to 300 gal. per acre.	Thoroughly wet brush after leaves are out.	Tank cars and 55 gal. drums.
6 Nalco Dalapon (liquid) Weed and Grass Control	Dilute 10 gal. with 90 gal. of water. Apply 100 gal. per acre.	After predominant grasses emerge. Use in combination with Nalco 2, 4-D.	Special 8000 gallon tank cars.
7 Nalco 2, 4-D Alkanolamine Weed Control	Dilute up to 3 gal. with 100 gal. dalapon solution per acre.	After predominant weeds emerge.	Tank cars and 55 gal. drums.
8 Ammate (liquid) Brush Control	Use 100-300 gal. per acre of dilute solution containing ¾ lb. per gal.	Thoroughly wet brush after leaves are out.	Tank cars.
9 Penta and Oil Weed Control	Dilute 30 gal. with 170 gal. water per acre.	After predominant weeds and grasses emerge.	Tank cars.
10 2, 4, 5-T (liquid) Brush Control	Dilute 1 gal. to 135 gal. of water. Use 100-300 gal. per acre.	Thoroughly wet brush after leaves are fully grown.	55 gal. drums.

NATIONAL ALUMINATE CORPORATION
SPRAY SERVICES DEPARTMENT

6196 West 66th Place
Chicago 38, Illinois

P.O. Box 5444
Huntington, West Virginia

In Canada: Alchem Limited, Burlington, Ontario

Nalco®

PRODUCTS . . . Serving the Railroads through Practical Applied Science

The NEW NORDBERG Tamping Power Jack

One Man Operation to Raise Track and Tamp Key Ties at Lifting Points

Here is another new Nordberg machine that will reduce your track maintenance costs . . .

The Nordberg Tamping Power Jack combines many of the features of Nordberg's well known Power Jack with those of its automatic Gang Tamper into a self-propelled machine which raises track and tamps key ties at lifting points.

The Nordberg Tamping Power Jack has two independently operated hydraulic rams which can accomplish a lift on either or both rails. The manually controlled tamping head carries four tamping bars, two inside of each rail, assuring solid tamping of the key ties.

Practically every part of the machine, including the tamping element, is contained inside the wheel gage so that it can be used at station platforms, in ballasted bridges and at any points of restricted side clearance. This feature also affords an excellent view of the rail to the man sighting the track.

A cross level and sighting targets, as well as a power actuated hydraulic set-off arrangement are built-in features of the Tamping Power Jack.

For further details on the new Nordberg Tamping Power Jack, write for your copy of Bulletin 259.

NORDBERG MFG. CO., Milwaukee, Wisconsin

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R256

NORDBERG
"Mechanical Muscles"®

ADZING MACHINE • TIE DRILL • RAIL DRILL • RAIL GRINDERS • CRIBEX® • BALLAST ROUTER • TRACKSHIFTER • DSL® YARD CLEANER • BALLASTEX® • SCREENEX® • TAMPING JACK • GANG TAMPER • POWER JACK • TRAKLINER • HYDRAULIC and MECHANICAL SPIKE PULLERS • SPIKE HAMMER • POWER WRENCH • GANDY-TIE PULLER and INSERTER • DUN-RITE® GAGING MACHINE

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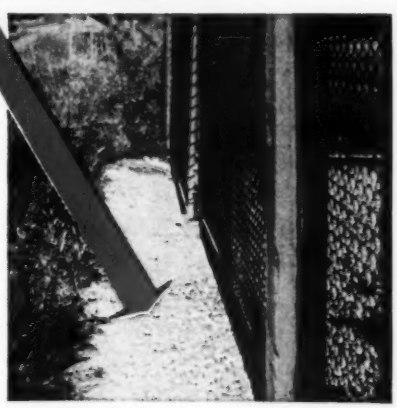
Look

NO WEEDS!

UREABOR*

WEED and GRASS KILLER

kills weeds—
prevents regrowth!



LOW RATE OF APPLICATION—
EFFECTIVELY DESTROYS WEEDS AND GRASSES
NOTHING TO MIX—NO WATER TO HAUL
NONCORROSIVE • NONFLAMMABLE

*UREABOR is a trade-mark of Borax Consolidated, Limited

MANUFACTURERS OF FAMOUS "20 MULE TEAM" PACKAGE PRODUCTS

One application—DRY—may keep soil bare for 1 or 2 years!

Here's new UREABOR . . . a ready-to-use weed killing compound so powerful that only 1 to 2 lbs. can destroy most types of vegetation in an area of 100 square feet! And control continues effective for long periods because UREABOR *maintains its plant-destroying activity in root zones.* Such low application rates mean greater convenience . . . less storage space for material. You'll say it's great!

Because of its granular form, UREABOR Weed Killer is easily broadcast by hand for spot treatments. Larger areas are more efficiently treated by using a mechanical spreader. For most effective distribution of the small amount of material required, we created an inexpensive, handy spreader especially for UREABOR Weed Killer.

Special Spreader now available...

The PCB Spreader applies UREABOR to best advantage, at prescribed low rates. It holds enough UREABOR to treat 1250 to 2500 sq. ft. without refilling—weighs a mere 6 lbs. Available now for just $10.75 delivered—anywhere in the U.S.A.

Write today for literature!

AGRICULTURAL SALES DIVISION

PACIFIC COAST BORAX CO.

DIVISION OF BORAX CONSOLIDATED, LIMITED

630 SHATTO PLACE, LOS ANGELES 5, CALIFORNIA

Skeletonize . . . Renew Ties . . . Reballast

FIRST PASS of double-track Cribber Plow skeletonizes, moving old material all to outside. Tie renewals made easy. While track is lifted by plow, ties can be knocked loose, new ties inserted.
SECOND PASS with Ballast Sled gives a lift of 4 to 8 inches. Sled works behind material flat car.

AFTER a pass with the plow to skeletonize and renew ties, sled was used to put a uniform 5-inch layer of new ballast under the ties.

. . . FASTER AND CHEAPER WITH THIS PROVEN MANNIX METHOD!

NOW . . . a job-proven *plow* method of ridding cribs of badly fouled ballast even under wet and muddy conditions, settles track on original bed ready for sled-ballasting and raising. Plows are available to work either single or double track. . . . a job-proven *sled* method of raising track on newly unloaded ballast or utilizing existing crib material for sub-ballast. Pefected by MANNIX, this new plow-sled team is now extensively employed by several leading roads, with overall cost savings of one-third on track maintenance and complete rehabilitation projects.

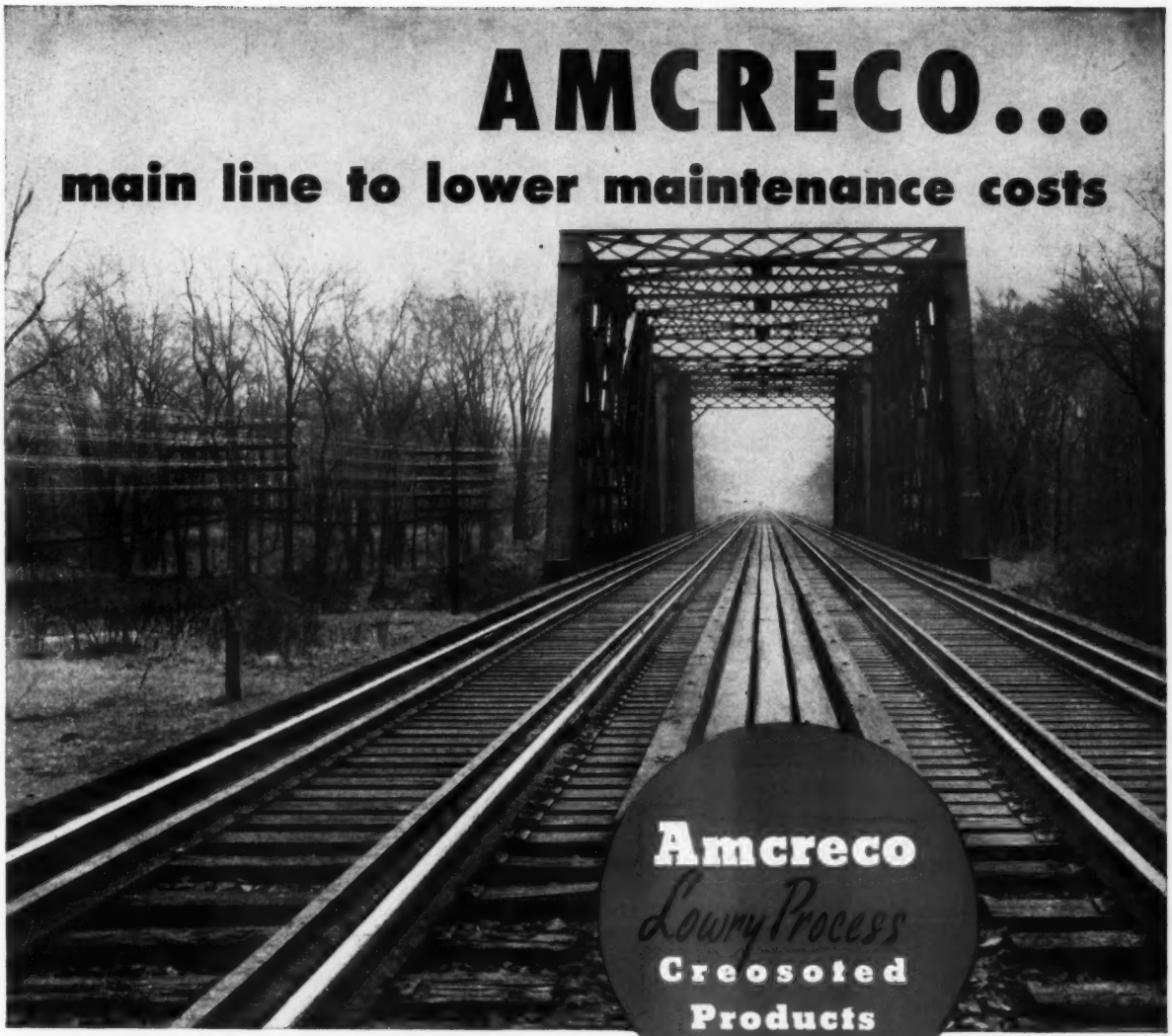
Write, wire, or phone today for further information. Plows and/or sleds are available on a special rental plan.

MANNIX INTERNATIONAL INC.

1154 Northwestern Bank Building, Minneapolis 2, Minn. Phone: FEderal 9-7709

AMCRECO...

main line to lower maintenance costs



Pressure treated for *Strength that Lasts*

Adzed and
Bored Cross Ties
Bridge Ties
Piles
Timbers

Just as railroad service has improved through the years—so has the quality of AMCRECO cross ties, bridge ties, piles and timbers. Through continuing research in the last quarter of a century, the service life of Amcreco creosoted products has been greatly extended. Improvements in our basic Lowry process of Creosoting under Pressure have given a green light to construction and maintenance economy. Write for a full explanation.

AMERICAN CREOSOTING COMPANY

Colonial Creosoting Company
Federal Creosoting Company
Indiana Creosoting Company

AMCRECO
LOWRY PROCESS
CREOSOTED WOOD

Gulf States Creosoting Company
Georgia Creosoting Company
Kettle River Company

Georgia Forest Products Company

GENERAL OFFICES: LOUISVILLE 2, KENTUCKY
12 FIELD SALES OFFICES TO SERVE YOU

WHICH weed killer?

SODIUM ARSENITE?

TCA ARSENITE?

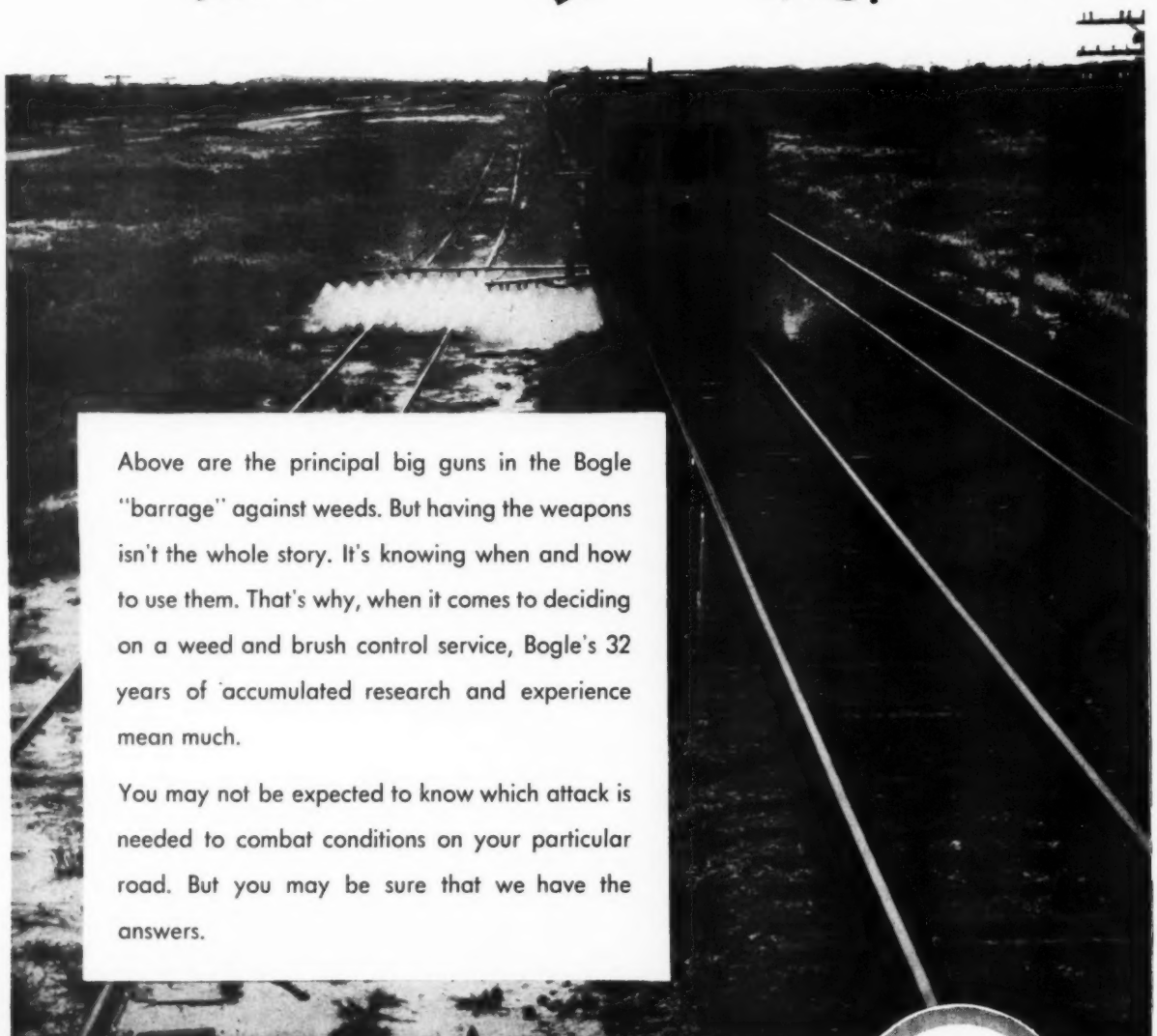
CHLORATE CHLORIDE?

TELVAR?

TCA CHLORATE?

DALAPON?

2,4-D?



Above are the principal big guns in the Bogle "barrage" against weeds. But having the weapons isn't the whole story. It's knowing when and how to use them. That's why, when it comes to deciding on a weed and brush control service, Bogle's 32 years of accumulated research and experience mean much.

You may not be expected to know which attack is needed to combat conditions on your particular road. But you may be sure that we have the answers.

The R. H. BOGLE Company

ALEXANDRIA, VA.

Memphis Tenn.

TRADE MARK R B H

COMPLETE WEED AND BRUSH CONTROL SERVICE

Esso Rust-Ban 373 gives equipment complete protection from corrosion in one fast application. More and more railroads are finding it ideal for stored parts such as axle journals and other heavy machined parts which may be stored outdoors for extended periods.

Esso RUST-BAN 373 offers four important advantages:—

1. No heating is required in applying Rust-Ban, permitting speedy application at normal temperatures by dip, spray or brush.

2. Its high resistance to abrasion means one coat lasts longer. The extremely durable coating of Rust-Ban safeguards equipment even after rough handling.

3. It dries to a hard film that is unaffected by rain and direct sunlight. And to withstand low temperatures, Rust-Ban contains special additives to prevent cracking and chipping. This all-weather protection keeps surfaces corrosion-free, saves expensive part replacements.

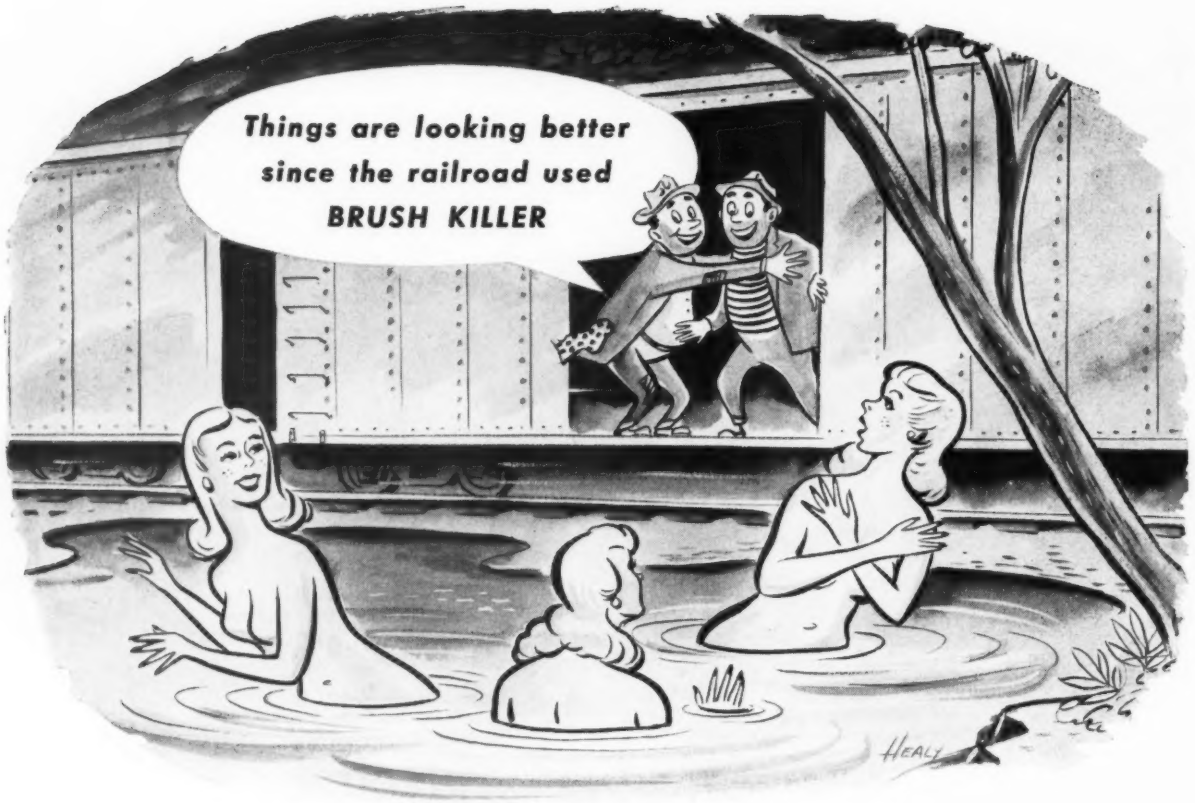
4. Economy is provided by excellent coverage – about 350 square feet per gallon. And Esso Rust-Ban 373 is easily removed by any good petroleum solvent such as Varsol.

Esso Rust-Bans are available in several types to meet every preservative need. *For more information,* write: Esso Standard Oil Company, Railroad Sales Division, 15 West 51st St., New York 19, N. Y.

Esso

RAILROAD PRODUCTS

Esso offers a complete line of dependable railroad products – Valuable years of experience in research and development, along with continual testing on the road and in the lab, stand back of the outstanding performance of Esso Railroad products.



Chipman Chemical Company weed killers, brush killers and application service are backed by over 40 years of experience in serving railroads. An extensive line of weed, grass and brush killing chemicals is available to meet varying conditions. Included are the following:

Atlacide	Atlas "A" Arsenical
Chlorax	Atlas "D"
Chlorax "40" • Chlorea	Brush Killer
TCA-Chlorax	Telvar W
Methoxone-Chlorax	Borax • Dalapon

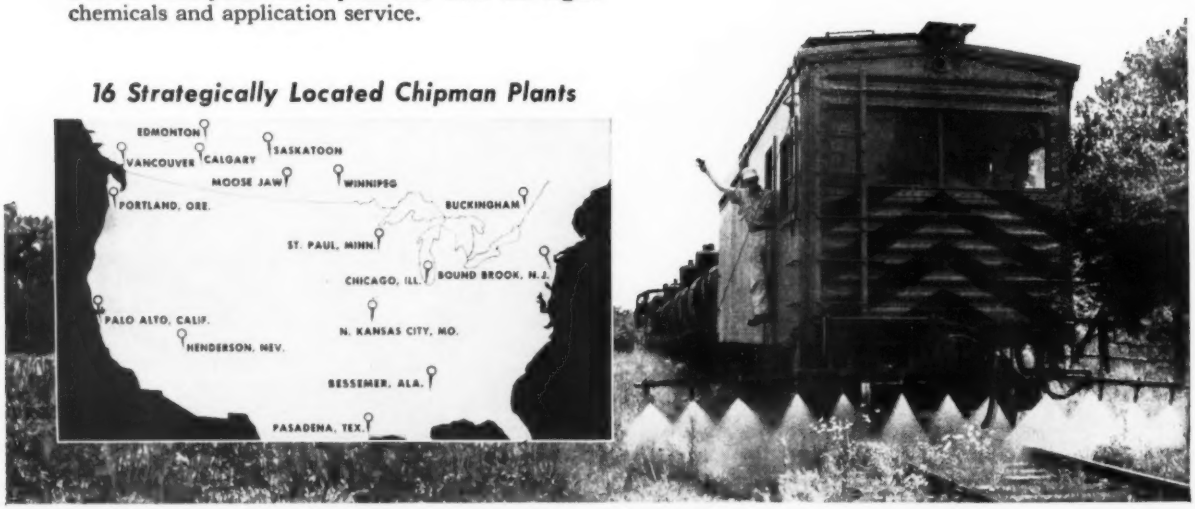
Let us solve *your* weed problems with the *right* chemicals and application service.

CHIPMAN

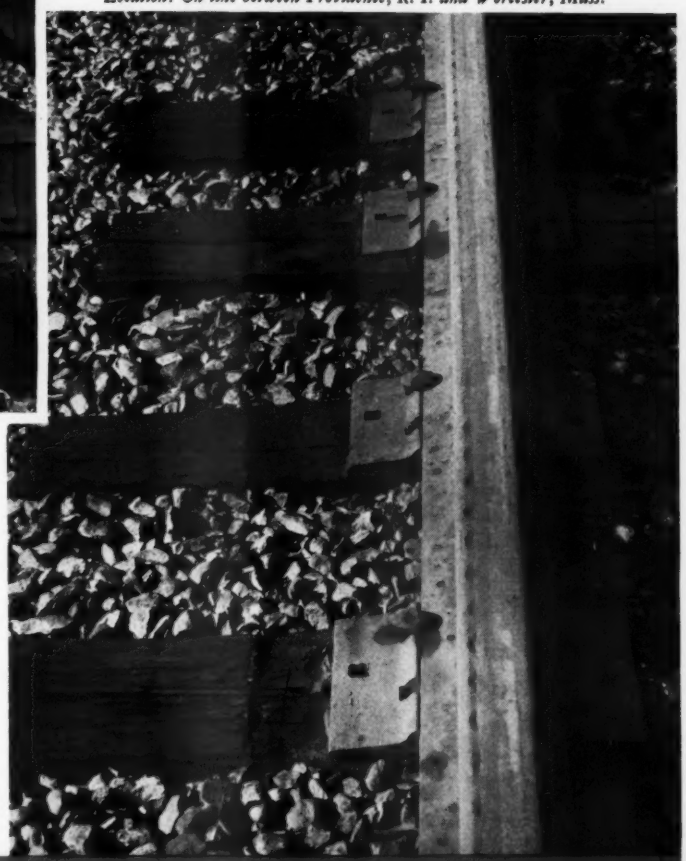
Chemical Company, Inc.

Bound Brook, New Jersey

16 Strategically Located Chipman Plants



Pictures: Courtesy N.Y.N.H.&H.R.R.Co.
Location: On line between Providence, R. I. and Worcester, Mass.



▲ *BIRD SELF-SEALING TIE PAD AFTER 5 YEARS' SERVICE is removed for inspection purposes. It was necessary to pry the pad from the tie owing to the tenacious seal that is characteristic of all Bird Tie Pads. Reapplied and becoming resealed after inspection, the Bird Tie Pad is good for many additional years of protective service.*

TYPICAL INSTALLATION OF BIRD SELF-SEALING TIE PADS applied out-of-face with new 115 lb. rail and 7¾" x 12" plates. Ties have been mechanically adzed where necessary to provide a smooth surface on sound wood and will start a new life cycle of reliable service through the protection afforded by Bird Self-Sealing Tie Pads. Beading at ends of pads is due to extrusion of surplus coating material and is indicative of proper pad performance. It is part of the effective seal provided by Bird Self-Sealing Tie Pads. ▶

Slash your tie costs 50% with BIRD Self-Sealing TIE PADS

HOW?

Bird Self-Sealing Tie Pads eliminate mechanical wear and plate penetration . . . form a waterproof, dustproof seal on the tie that protects the vulnerable area under plates and around spikes.

WHERE?

- On the joint and shoulder ties of insulated joints.
- On new or older bridge decks.
- On switch timbers.
- Under crossing frogs.
- Through highway grade crossings and station platforms.
- On curves to insure holding track to gauge and surface.
- With smaller tie plates.
- Out-of-face with new or relayer rail.
- On pile cut-offs.

RESULTS

- You get 50% extra life from new ties.
- You get twice the normal remaining life expectancy from old ties that can be adzed to a smooth surface of sound wood.
- You save on gauge, line and surface maintenance costs in addition to savings on tie life.

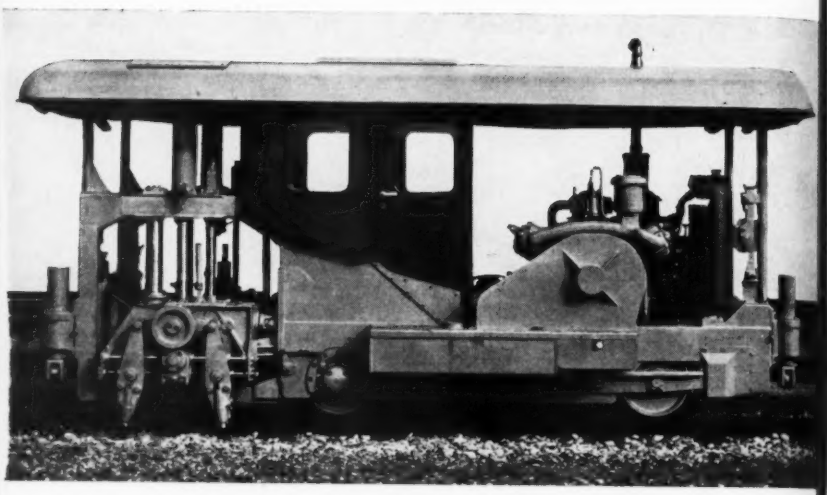
WHEN

You start saving as soon as you start using Bird Self-Sealing Tie Pads. Bird's is the original self-sealing tie pad . . . proven by years of in-track service. Write for further information, today . . . Bird Tie Pads, Dept. HTS-4, East Walpole, Mass.

BUY THE BEST BIRD & SON, inc. Established 1795 **BUY BIRD**

Matisa

B-24 TAMPER



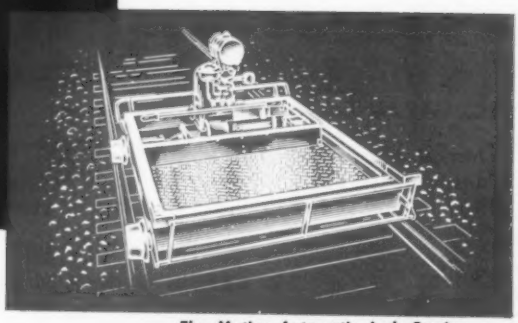
NOW... **EASIER THAN EVER TO HANDLE**

Pneumatically assisted operating controls have been added to increase production and assure uniform tamping.

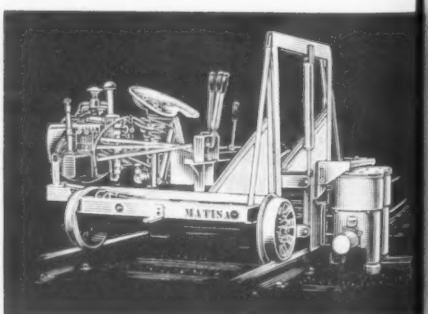
NOW... **MORE ECONOMICAL TO MAINTAIN**

Advanced type of oil clutch installed in a power transmission system of the most modern design improves performance and reduces wear.

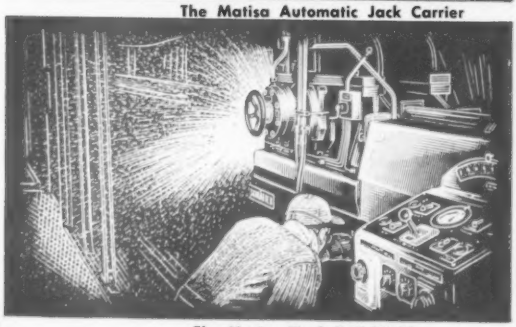
For more information see page 203 of the 8th Edition of Railway Track & Structures Cyclopedia or send for literature.



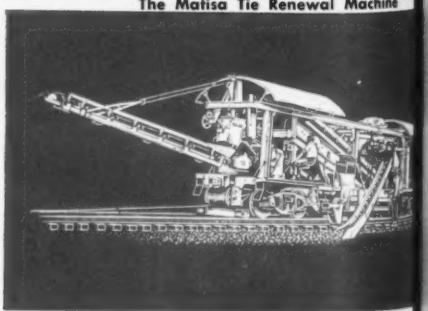
The Matisa Automatic Jack Carrier



The Matisa Tie Renewal Machine



The Matisa Flash Rail Welder



The Matisa Ballast Cleaner

Matisa

EQUIPMENT CORPORATION

1020 WASHINGTON AVE. • CHICAGO HEIGHTS, ILLINOIS

News Notes

. . . a resumé of current events throughout the railroad world

RAILWAY
TRACK and STRUCTURES
APRIL, 1956

Railroads are demanding from the Brotherhood of Locomotive Firemen & Enginemen the unrestricted right to determine when a fireman shall be used on other than steam locomotives. This demand was contained in a proposal recently presented to the union.

•

Approximately $475 million a year will be added to the freight revenues of railroads as a result of rate increases authorized by the Interstate Commerce Commission in the Ex Parte 196 case. This is about $125 million short of what would have come from the across-the-board raise of 7 per cent that the railroads had originally requested.

•

Nearly $17 million will be spent by the Union Pacific in 1956 for new rail installation, tie replacement and roadbed reballasting. A total of 198.99 miles of new 133-lb rail and 181.5 miles of new ballast will be installed. Nearly one million ties will be replaced on the road's 10,000 miles of track this summer.

•

We must have "super-railroads," says John W. Barriger, vice president of the Rock Island, if the railroad industry is to keep ahead of competing forms of transportation. An expenditure of $20 billion over a 7-year period will be needed, he explains, to make the required improvements.

•

Eleven years of research have yielded a coal-fired gas-turbine combustion system for locomotives which effected savings of 63.6 per cent in operating costs as compared to results with diesels, according to R. B. White, chairman of the Locomotive Development Committee. Actual building of the locomotive is expected to begin in 1957.

•

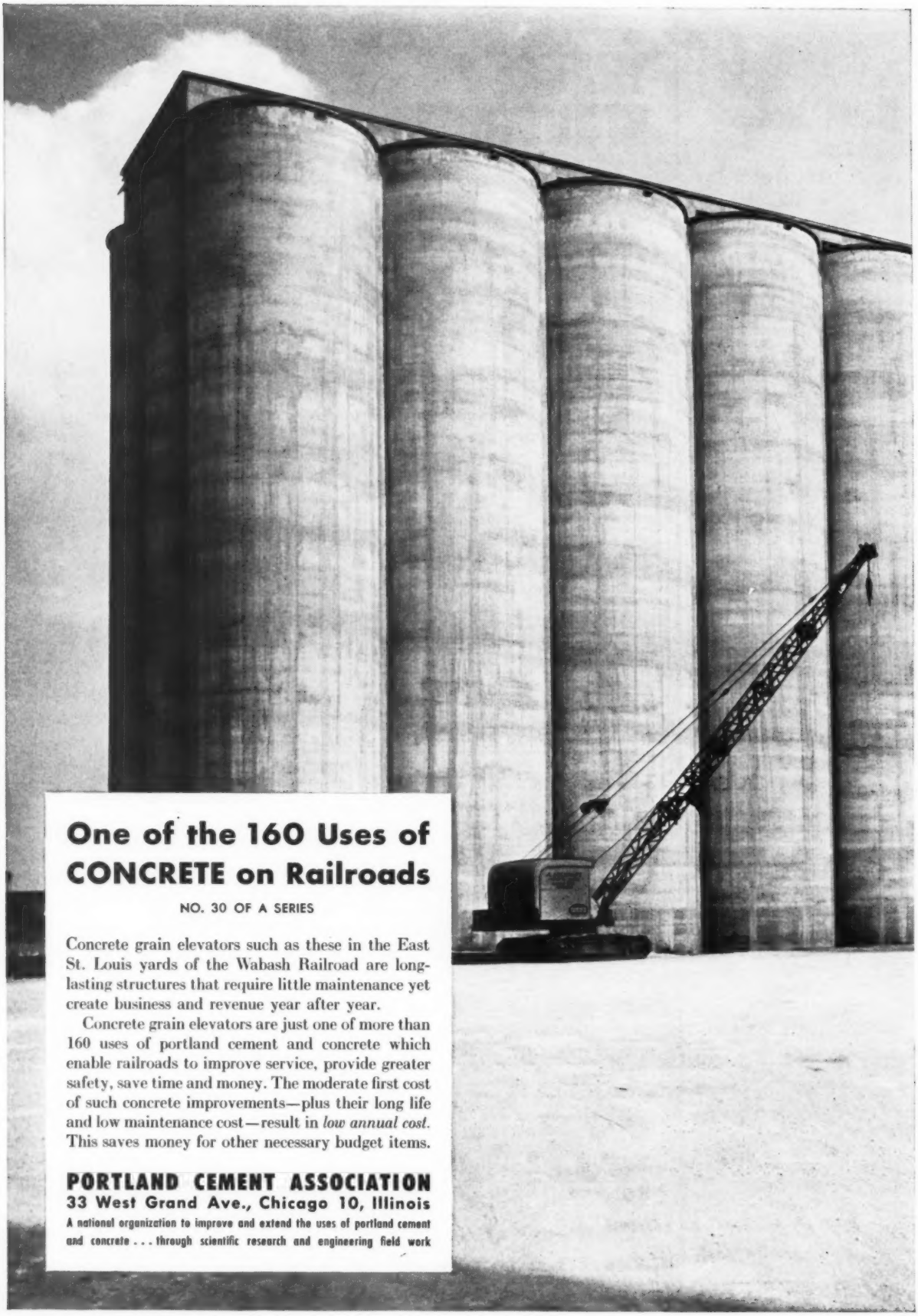
A 55-passenger coach, suspended from a single running rail of 30-in steel pipe, recently received its first operating tests in Houston, Tex. The car, built by Monorail, Inc., is powered by two 305-hp gasoline engines and has eight wheels with pneumatic tires. Sixteen guide wheels hold it on the single running rail.

•

Elimination of parallel trackage will not reduce a railroad's local property taxes, says William White, president of the Delaware & Hudson. Claims of such savings should be discounted as governing bodies have established tax income needs and will simply increase the assessments on remaining tracks. However, this does not mean savings might not be achieved in operating and maintenance expenses or in income taxes, he added.

•

The Chesapeake & Ohio is experimenting with a new type of vehicle called "Railvan," which has two sets of retractable wheels. One set is equipped with tires for use on highways, and the other has flanged wheels for operation on rails. In operation, a loaded "Railvan," with tires down, would move over streets from shipper's dock to rail yard. Then, with wheels reversed, the units would move by rail to destination. Final delivery would be made with the vehicle again moving over streets like a standard trailer.



One of the 160 Uses of CONCRETE on Railroads

NO. 30 OF A SERIES

Concrete grain elevators such as these in the East St. Louis yards of the Wabash Railroad are long-lasting structures that require little maintenance yet create business and revenue year after year.

Concrete grain elevators are just one of more than 160 uses of portland cement and concrete which enable railroads to improve service, provide greater safety, save time and money. The moderate first cost of such concrete improvements—plus their long life and low maintenance cost—result in *low annual cost.* This saves money for other necessary budget items.

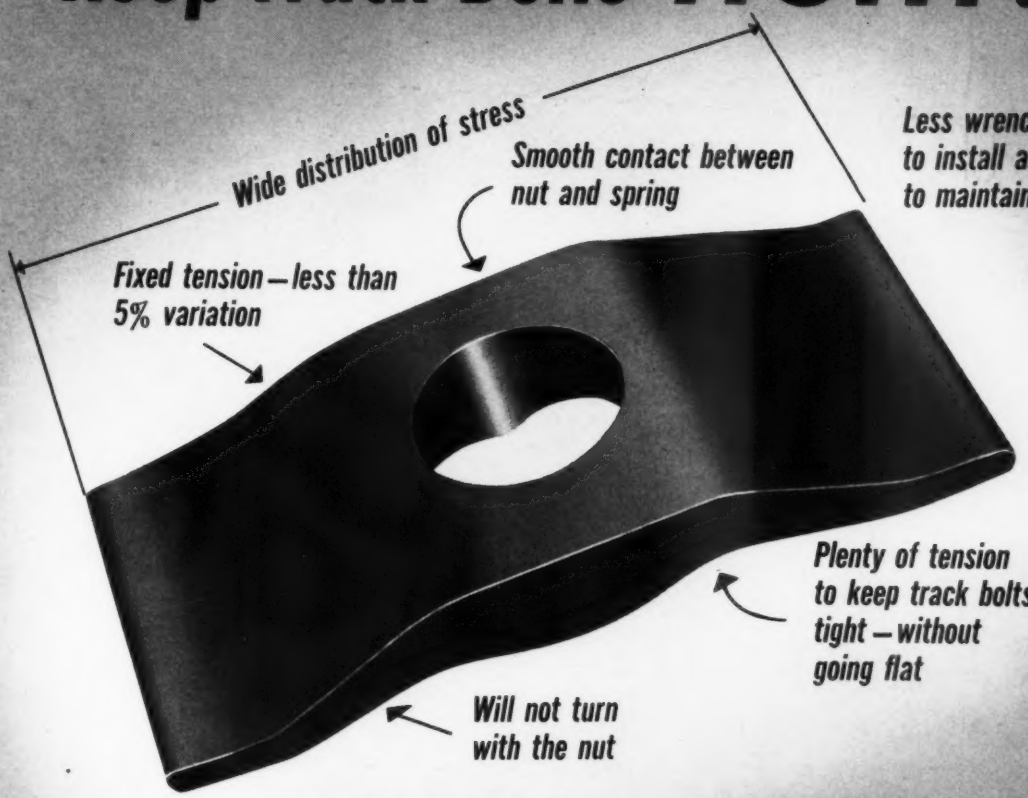
PORTLAND CEMENT ASSOCIATION
33 West Grand Ave., Chicago 10, Illinois
A national organization to improve and extend the uses of portland cement and concrete . . . through scientific research and engineering field work

VERONA

FIXED TENSION TRIFLEX

SPRING WASHERS

Keep Track Bolts TIGHT!


Wide distribution of stress
Smooth contact between nut and spring
Less wrenching to install and to maintain
Fixed tension—less than 5% variation
Plenty of tension to keep track bolts tight—without going flat
Will not turn with the nut

UNIFORM BOLT TENSION
prevents track buckling and pull-apart

HIGHEST REACTION OF ANY SPRING WASHER

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SPOT-AIR

36 cfm

SO SMALL - SO LIGHT SO EASY TO MOVE!

no other gasoline powered compressor like it!

With lifting bar in place, two men can easily carry the SPOT-AIR across tracks or over obstacles. And with the wheelbarrow mounting shown below, one man can move it with ease, keeping up with the progress of the job.

...yet Spot-Air provides ample, low-cost power for FOUR TIE TAMPERS

For railway maintenance work you need a compressor you can take anywhere—operate anywhere. That's the Ingersoll-Rand SPOT-AIR—the smallest, most *portable* self-powered compressor ever developed. It weighs only 265 pounds, ready to run. It takes up only 27″ by 27″ of floor space on a section car. One or two men can easily move it from place to place on the job.

The SPOT-AIR is built to stand up in heavy duty service. Its air-cooled engine operates under extreme weather conditions with no danger of freezing or overheating. Simplicity of design, with heads, valves, carburetor and magneto all readily accessible, reduces maintenance time to the minimum.

For maintenance of way, bridge construction, grade crossings, signal repairs and a host of other railroad jobs—the SPOT-AIR gives you dependable, low-cost air power, anywhere, any time. For full details, send for a copy of new Bulletin 2264-B.

Ingersoll-Rand

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AIR POWER AND AIR TOOLS FOR LOW COST MAINTENANCE OF WAY

NEW...
Bonus Powered
too!
INTERNATIONAL

NEW

124 Net Engine Horsepower. In International Drott Machines, Engine develops 134 Net Horsepower.

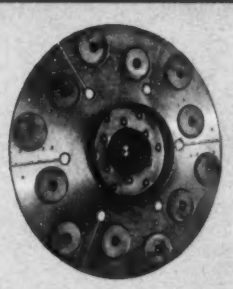
182 Series

TD 18

TD-18 diesel (series 182) delivers 103 drawbar horsepower, with weight of 29,050 pounds (without equipment). All-weather electric starting, standard equipment. "New look" visibility, operating ease never before available. New heavy-duty, swinging-door type radiator guard is "standard"—for carrying heavy front-mounted equipment. Gives big tractor performance in pioneering under roughest conditions. Powers 3-yard International Drott Skid-Shovel, anywhere.

No costly delay from a "killed" or cold engine—you start fast! Famous International gasoline-conversion diesel starting—actual "in-seat" starting—is standard equipment on this new crawler line. With "push-button" ease, you get seconds-fast starting, whether the engine is cold, or stopped! And you're on the job seconds-fast, when minutes are dollars.

Cerametallic Engine Clutch Facings Save power, defy heat, prolong life! Uncomplicated, *familiar-to-all* engine clutch design of these new crawlers have power-holding, heat-defying, long-lasting Cerametallic facings. These facings reduce lever-pull up to 50%, provide amazing heat immunity, add service freedom, cut upkeep!



Now . . . 500-hour lube intervals! new metal-to-metal, track roller s... You save the time and expense of ... quent inspections or lubrications, ... new *full-floating*, cartridge-type, ... roller seals provided on the TD-24, ... and TD-14. These precision-lapped metal-to-metal seals are so effective ... give you safe 500-hour intervals ... roller lubrications!

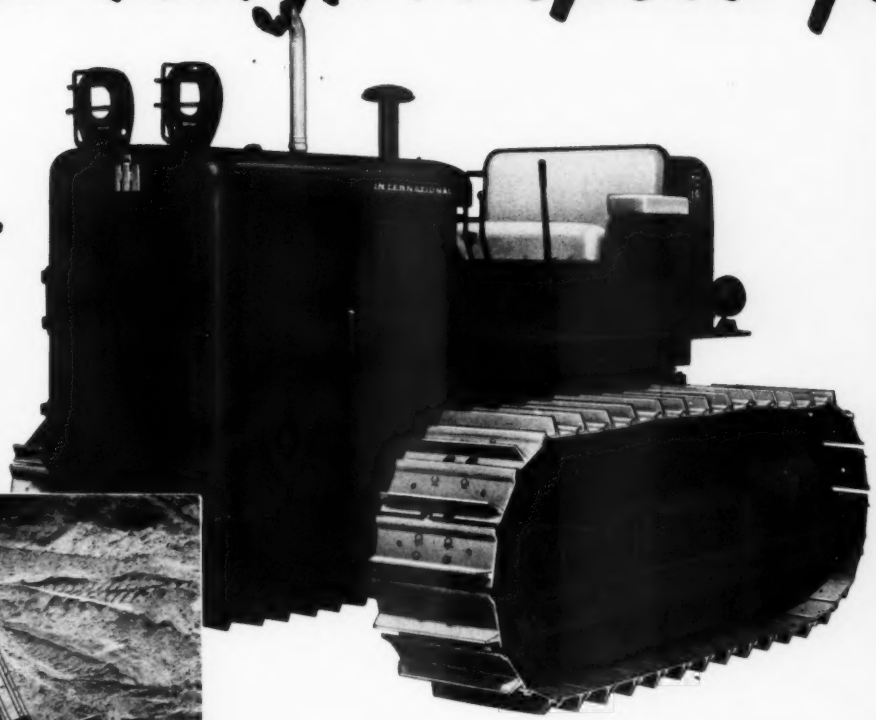
International® Crawlers gi

plus new design to speed yo

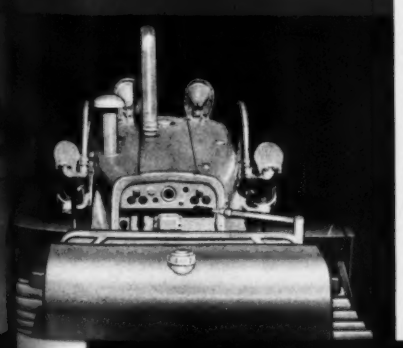
95 Net Engine Horsepower.

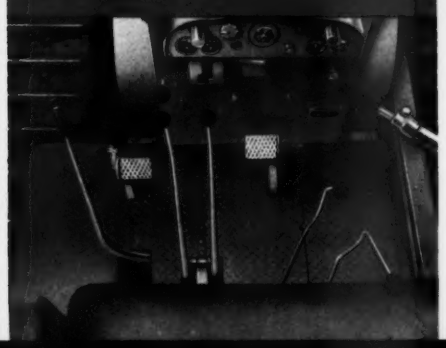
142 Series

TD 14



TD-14 (series 142), 78.5 drawbar hp; weighs 21,095 pounds (without equipment). Features "new look" engineering, job-speeding visibility, new equipment-carrying and operating strength. All-weather electric starting, standard equipment. It's a fast, responsive, big-capacity dozing tractor. Powers 2¼ cu. yd. International Drott Skid-Shovel or Four-In-One; 15-ton capacity Superior Pipe-Boom; other similar-sized equipment.



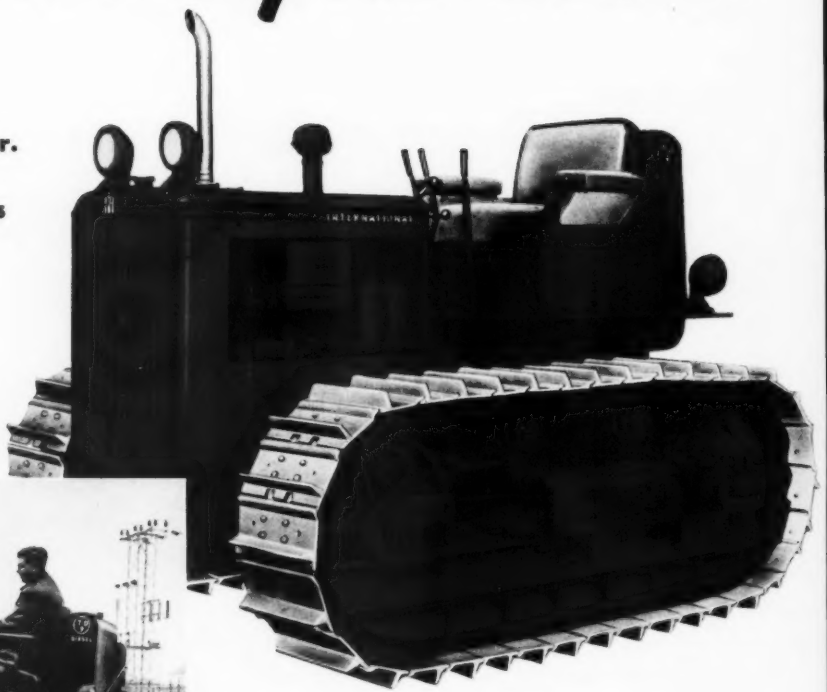


ve you Bonus horsepower—
ur jobs, control your costs!

66 Net Engine Horsepower. In International Drott Machines, Engine develops 71 Net Horsepower.

91 Series

TD 9

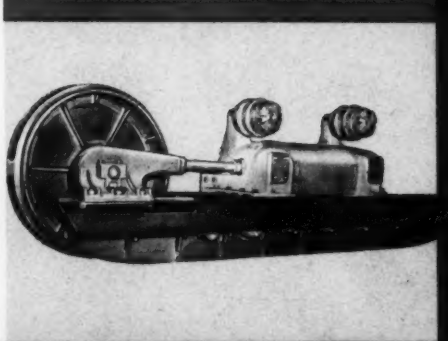


TD-9 diesel, (series 91), delivers 54.5 drawbar hp—up 32%. Operating weight (5-roller model), without equipment, 12,000 pounds. Now up in a new heavy-duty job range. New power is backed by new power train and track frame strength, new operating and servicing ease. Powers International Drott 1½ cu. yd. Skid-Shovel and other equipment requiring similar power.

480-hr. full-flow lube oil filters guard bearings, cut upkeep! Every drop of oil on its way to lubricate moving engine parts must pass through these new abrasive-trapping micron-type filters—with the capacity, strength, and efficiency to give 480 hours of wear-fighting, upkeep-cutting duty!

Hydraulic Power Steering Inspires Operator Cooperation! New hydraulic power steering of the TD-14 and TD-18 cuts operator fatigue—and along with the other big effort-saving advantages, makes it easier than ever to deliver full-capacity production! TD-6 and TD-9 have spring boosters to lighten the operator's job.

"Bridge-strong" track frames for "slam-bang" conditions! You are looking at the strongest track frame in the industry for crawlers of TD-18 and TD-14 size! Heavy steel box-section beams, weld-joined to heavy stress-relieved steel plates—and rigidly gusset-braced—they're your foundations for record-making "rough-and-tumble" performance!



Steps up a size... in job range and capacity!

50 Net Engine Horsepower. In International Drott Machines, Engine develops 55 Net Horsepower.

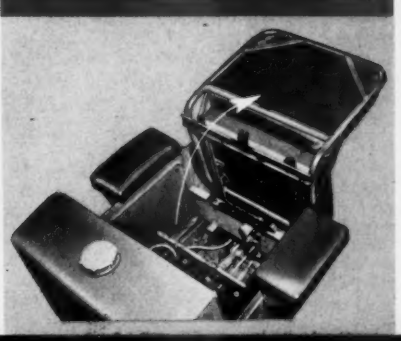
61 Series

TD 6

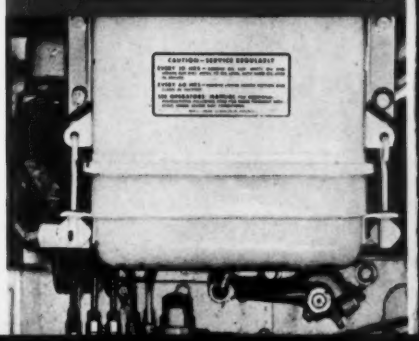
TD-6 diesel (series 61), 41.5 drawbar hp, up 23%! Steps up a whole size in work capacity and earning ability. Operating weight (5-roller model), without equipment, 8,890 pounds. Powers 1-yard International Drott Skid-Shovel or Four-In-One; serves as clean-up dozer unit on any-sized contract; versatility and low operating cost to do many sizes of jobs for every size of contractor.

Full-view, one-glance panel saves time—cuts effort! One quick glance at this new full-view panel, with centralized instrument grouping, gives the operator the instant check-up, to assure that lubrication, generator, and cooling system are "perking" for full production!

New Fold-over Seat Aids Fast, Centralized Servicing! New fold-over seat of the TD-6 and TD-9 models allows operator to give you the time and convenience advantages of centralized steering clutch assembly servicing. Lubricant fittings are conveniently grouped and fully accessible!

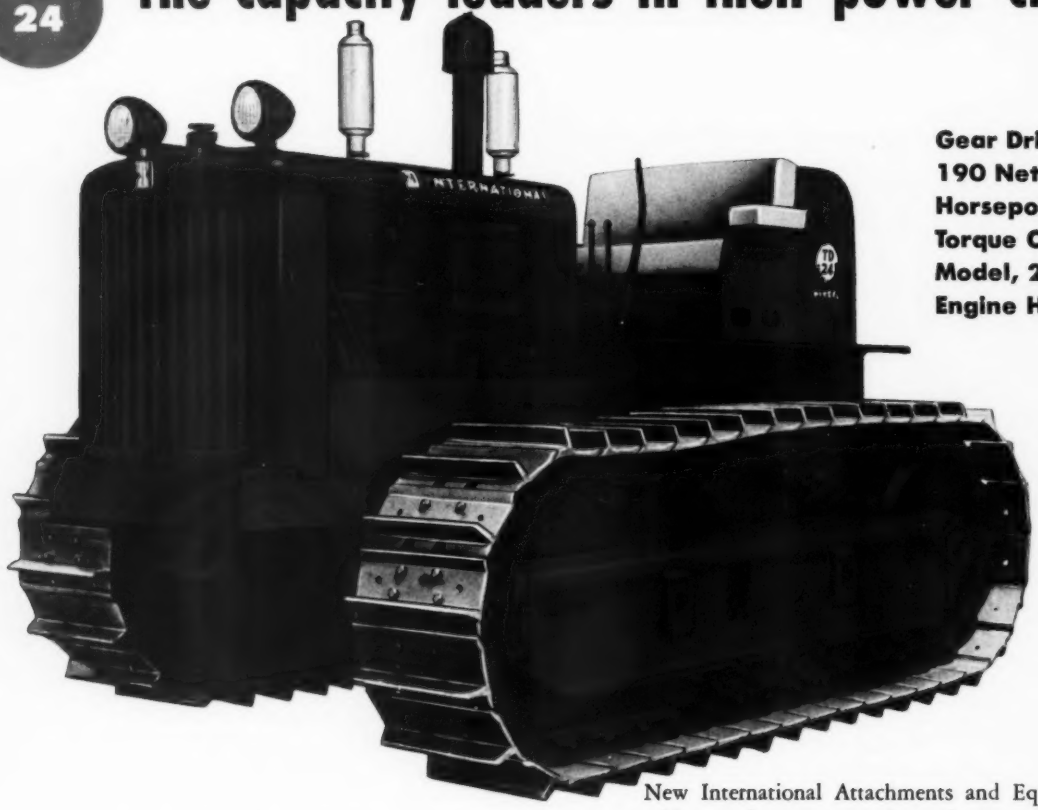


Thorough air filtration assured by new under-hood cleaners! Instead of being "in your lap," or a knee-bumping obstruction, air cleaners of the new International crawlers are side-mounted—for easy accessibility, yet out of the way. They have big capacity and high efficiency, too, for positive air filtration!



TD 24

The capacity leaders in their power class



Gear Drive Model, 190 Net Engine Horsepower
Torque Converter Model, 200 Net Engine Horsepower

Massive—with 43,080 pounds of rock-dozing, scraper-pushing brawn (7-roller torque converter model)*—the TD-24 can give them all a lesson in operating ease, big capacity, and positive load control! Has instant high-low range and exclusive Planet Power steering to give you its tremendous *pushing*, *pulling*, and *lifting* power on any terrain—with responsiveness not available elsewhere! *Live power on both tracks, on every turn!* Backed by equipment engineered to match its strength and power!

*Gear Drive 7-roller model weighs 42,780.

New International Attachments and Equipment team with new bonus-powered crawlers to give you high-producing performance packages: 42 new Bulldozers, to fit your needs exactly . . . 4 new Drott Loaders, 1 to 3-cubic yard capacity . . . 4 new Superior® Pipe-Booms, 8 to 55-ton capacity; 3 job-proved PCU'S! . . . **Measure . . . compare . . . prove to yourself . . . new bonus-powered International crawler tractors beat anything else on tracks! Try this turnpike-paced new power for capacity, operator preference, profit potential. Ask your International Industrial Power Distributor for a bonus-powered demonstration *to your specifications!***

INTERNATIONAL HARVESTER

International Industrial Powe

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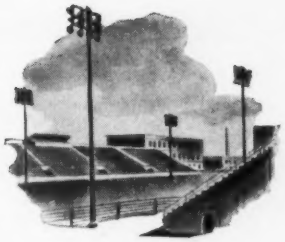
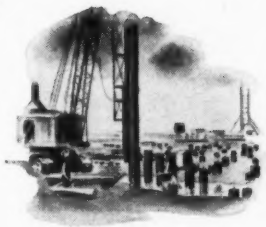
A COMPLETE POWER PACKAGE INCLUDING: Crawler, Wheel, and Pipe-Boom Tractors . . . Self-Propelled Scrapers and Bottom-Dumps . . . Tractor and Rubber-tired Loaders . . . Diesel and Carbureted Engines . . . Motor Trucks.

Street Lighting Poles

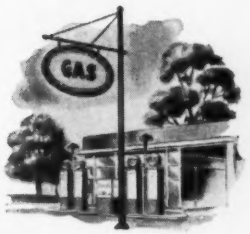
Highway Lighting Poles



Floodlighting Poles

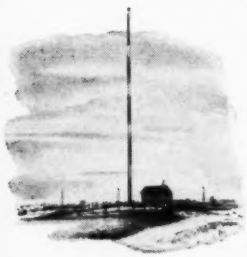


Foundation Piles

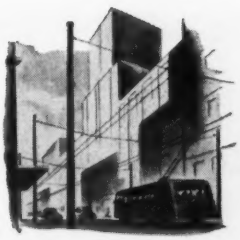


Sign Poles

Overhead Sign Supports



Antenna Poles



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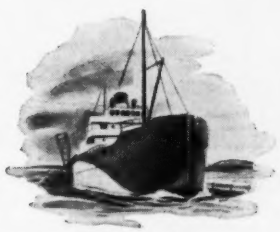
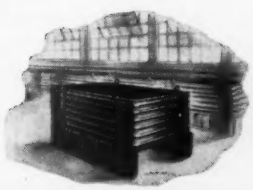
QUALITY and **SERVICE**



Booms and Masts



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save time . . . save money

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RTW
CROSS AND SURFACE GRINDERS

You'd have to make a long list to include all the famous railroads which depend on RTW Grinders to keep rails in perfect condition! The nation's foremost lines have found that where RTW maintenance equipment leads the way, economies naturally follow. Here are just two of the RTW machines that save time and money on America's most modern railroads.

PORTABLE CROSS GRINDER! MODEL P-11-S—This lightweight and versatile grinder was developed especially for the easy removal of overflow metal at rail ends, and cross grinding behind welding crews.

All grinding equipment and the 4 hp air-cooled gasoline engine pivot 360°—one grinding head works both rails. Equipment is mounted on carriage which traverses between rails on ball bearings running on steel guides.

Pivoted foot-clamping device with automatic release holds grinder firmly against rails during slotting. Cutting wheel handle is spring-mounted and hinged, giving perfect control over depth of cut made by 8" wheel. Track wheels are insulated—no interference with train signals. V-belt drive simplifies operation and maintenance.

COMBINATION CROSS GRINDER AND SURFACE GRINDER. MODEL P-38 — Economical — dual purpose — two grinder heads. Has narrow cutting wheel for slotting and removing overflow metal at rail ends, and straight 1¼"-thick wheel for surface grinding. Limiting device prevents track gouging while surface grinding. Special hand wheel permits back-and-forth oscillation of machine for grinding.

Machine is light, portable, for quick handling under traffic. Clamping device holds track wheels tight to rail during cutting. Gears are totally enclosed. 6 hp air-cooled gasoline engine and grinding equipment are mounted on transverse carriage operating on ball bearings over steel guides.

Ingenious spring-tension device permits uniform slotting. Power transmission is by V-belts—adjustable—makes maintenance simple. Machine comes equipped with swivel-top "stool" to facilitate turning from one side of track to the other.

LEARN MORE ABOUT THESE AND OTHER RTW TRACK MAINTENANCE MACHINES—WRITE TODAY FOR LITERATURE

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TRACK MAINTENANCE MACHINERY

Rail Grinders • Switch Grinders • Cross Grinders • Surface Grinders
Rail Drillers • Ballast Extruders • Bit Sharpeners • Tie Nippers
Grinding Wheels • Cut-off Wheels • Track Liners

(Above) A 1½-cu. yd. Bucyrus-Erie 38-B dragline digs a drainage ditch along a stretch of tracks in Florida.

(Below) This ¾-yd. Bucyrus-Erie 22-B dragline is working on construction of a roadbed in South Carolina.

THAT FITS RIGHT INTO YOUR COST-CUTTING PROGRAM

When you look for new ways to cut costs on right-of-way construction and maintenance, look into a versatile Bucyrus-Erie excavator.

Its ability to handle different jobs is multiplied by quick-change front ends — your maintenance crew can convert to shovel, crane, dragline or clamshell right in the field without major changes in main machinery.

On excavating work, powerful crowd action and high-speed dig, swing and dump cycles result in sustained high output. Precision control provides the kind of accuracy needed for time-saving crane work. Sound engineering that assures proper weight distribution, and extra strength without dead weight means less maintenance and real operating economy.

Our distributor in your area has the complete story on Bucyrus-Erie excavators from ⅜- to 4-cu. yd.— see him soon. 128E55

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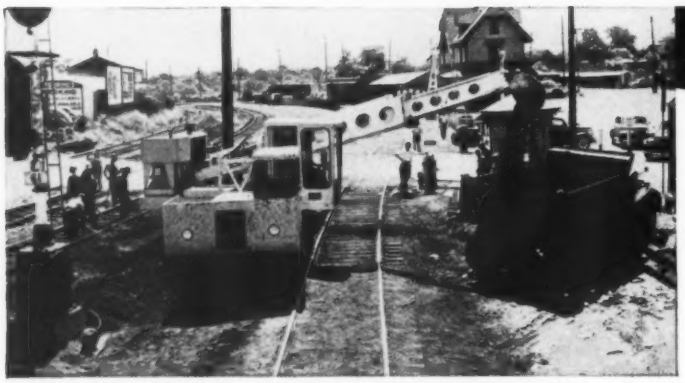
South Milwaukee
Wisconsin

75 YEARS OF SERVICE to Men Who Shape the Earth

Gradalls® CUT COSTS FOR STILL MORE RAILROADS!



11 DIFFERENT JOBS ALL HANDLED BY ONE GRADALL on this million dollar track relocation project. Gradall made it a "one machine" job.

RAILROAD GRADALL, WITH TRACK-CLIMBING TIRES, works over every mile of your right-of-way. This machine did 5 jobs in a day on a western railroad.

GRADALL RE-ALIGNED TRACK FOR ¼ PREVIOUS COST on this eastern railroad project. This is just another of the "bonus" jobs on which the multi-purpose Gradall cuts costs.

® Reg. U. S. Pat. Off.

GRADALLS ARE USED BY ALL THESE LEADING RAILROADS:

Atlantic Coast Line
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Central Railroad of New Jersey
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Great Northern
New York Central
New York, New Haven & Hartford
Nickel Plate Road
Pennsylvania
Southern Pacific
Union Railroad
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British Railways, England
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LOOK AT THIS PARTIAL LIST OF RAILROAD JOBS HANDLED BY GRADALLS:

- Cleaning tracks and roadbeds
- Maintaining ditches
- Laying rail
- Restoring embankments
- Trenching and backfilling
- Widening cuts and fills
- Excavating and grading
- Ripping and loading pavement
- Snow and ice removal
- Stockpiling
- Placing culverts, pipe, etc.
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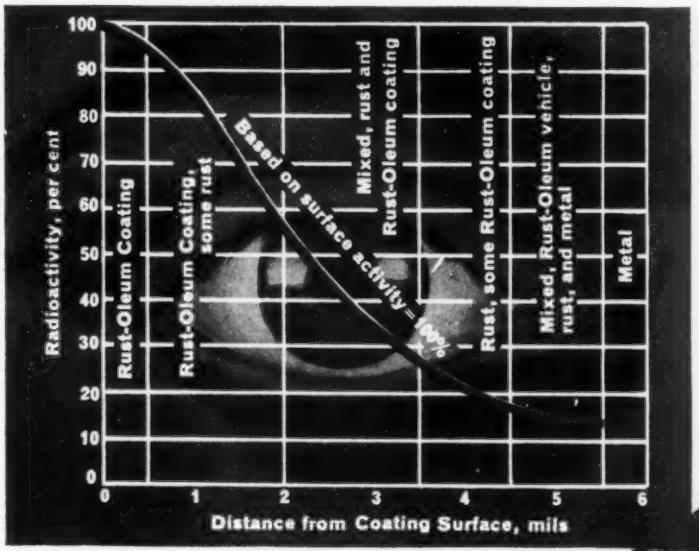
DIVISION OF WARNER & SWASEY Cleveland
PRECISION MACHINERY SINCE 1880

For a Gradall field demonstration on your work, write: Gradall Division, Warner & Swasey Co., Cleveland 3, Ohio.

YOU CAN DO IT BETTER, FASTER, FOR LESS WITH A GRADALL

See Rust-Oleum *penetrate rust* to bare metal through the "Eyes" of Radioactivity!



Curved line illustrates Rust-Oleum penetration through rust at each mil level as recorded by Geiger Counter.

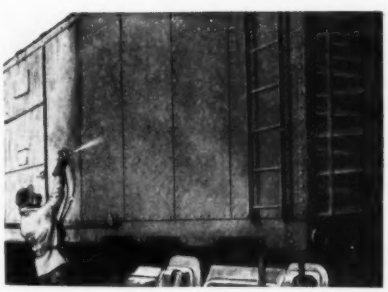
Rust-Oleum dries to a firm, decorative coating that resists salt water, sun, fumes, heat, humidity, and weathering.

Geiger Counter traces Rust-Oleum penetration to bare metal! In nearly three years of radioactive research, Rust-Oleum's *specially-processed* fish oil vehicle was radio-activated and formulated into Rust-Oleum 769 Damp-Proof Red Primer – then applied to rusted test panels. Rust-Oleum's specially-processed fish oil vehicle was then traced through the rust to bare metal by Geiger Counter.

This penetration means rust-stopping power, because the fish oil vehicle works its way into the tiny pits in the metal where it drives out air and moisture that cause rust. Important savings are yours, because Rust-Oleum can be applied directly over sound rusted surfaces – usually eliminating costly surface preparations. Attach coupon to your business letterhead for your copy of the thirty-page report entitled, "The Development of a Method To Determine The Degree of Penetration of a Rust-Oleum Fish-Oil-Based Coating Into Rust On Steel Specimens," prepared by Battelle Memorial Institute technologists.

There is only one Rust-Oleum. It is distinctive as your own fingerprint.

RUST-OLEUM®



STOPS RUST!

Rust-Oleum is available in practically all colors, including aluminum and white.

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- ☐ Complete literature with color charts.
- ☐ Thirty-page report on Rust-Oleum penetration.
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Now the Ametron® ELECTRONIC TRACK SCALE

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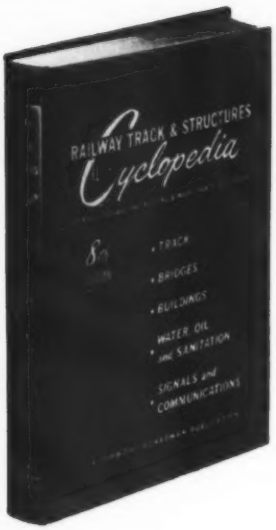

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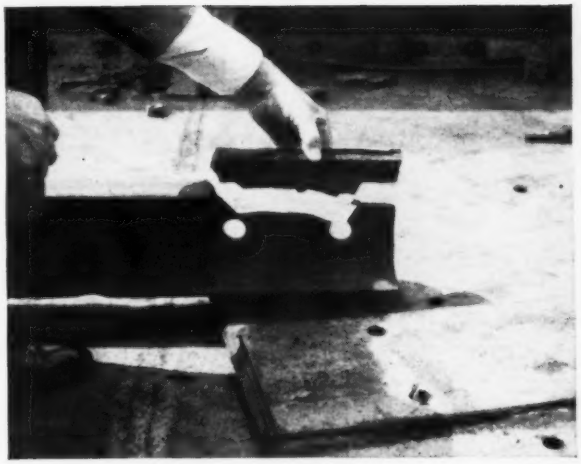
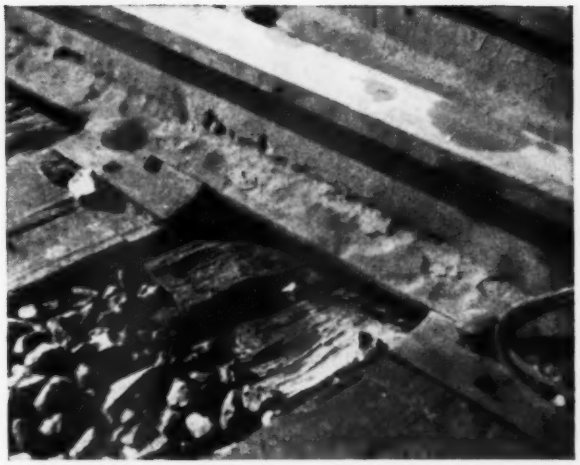


Corrosion fatigue caused this rail end failure. NO-OX-ID prevents these hazards.



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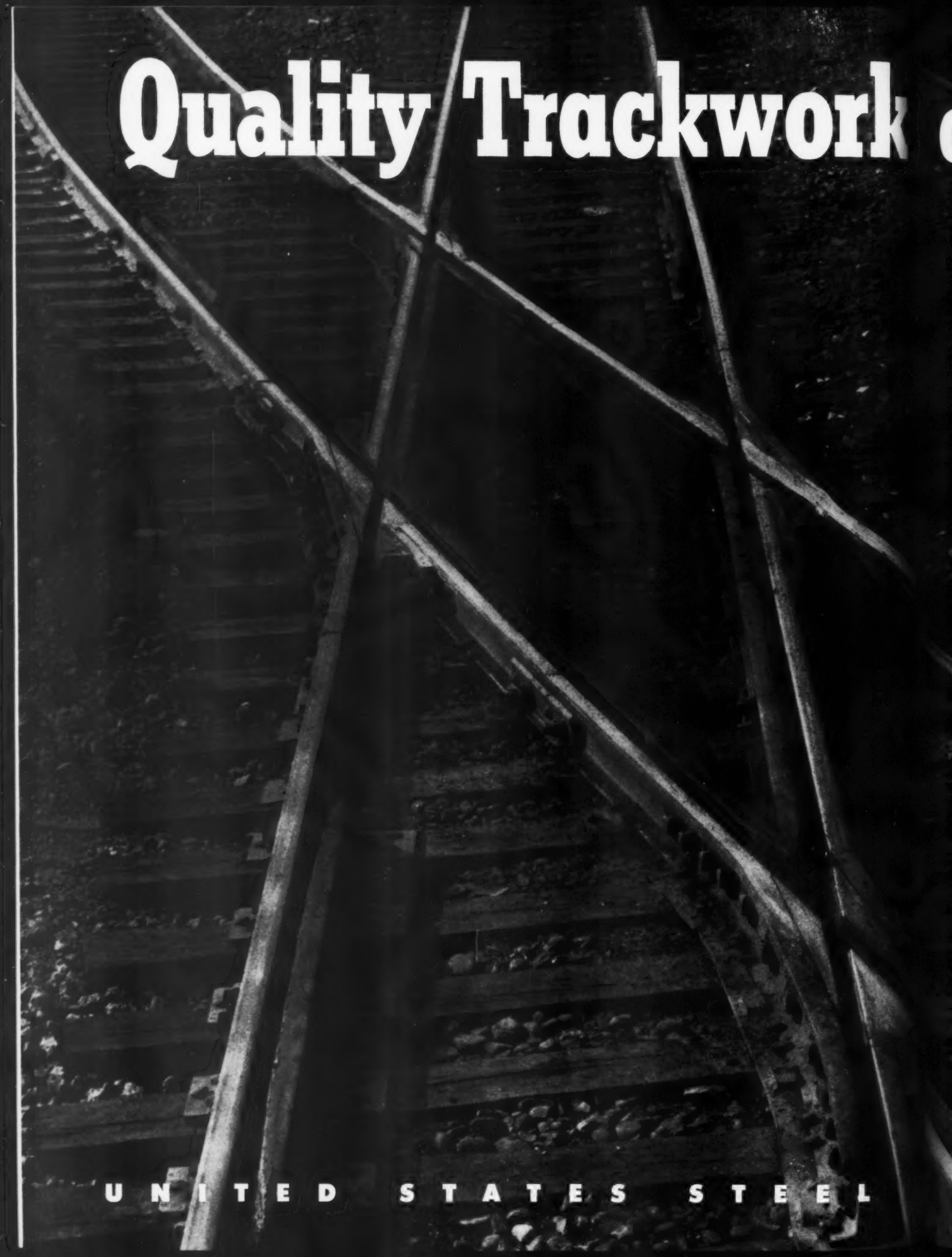
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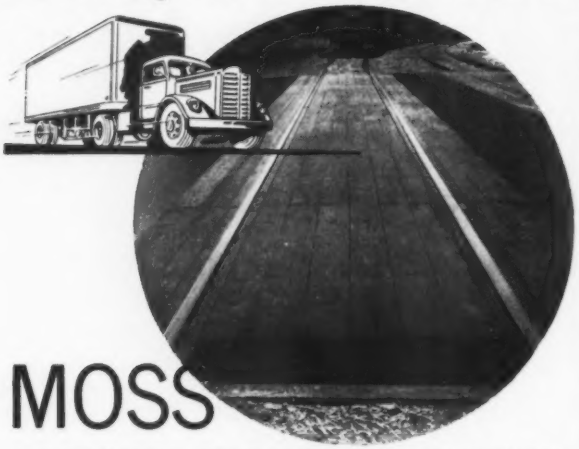

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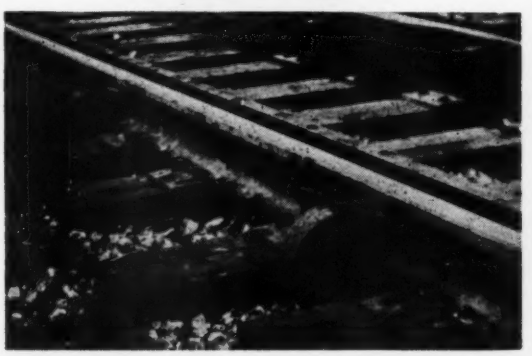

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An Allison torque converter protects the unit from shock loads while a full power-shift transmission—WITHOUT CLUTCH— permits quick shifts under full load, without interrupting the power flow from the engine to the load. A tail shaft governor automatically adjusts engine RPM to meet any load condition, at any speed set by the operator.

Exclusive with Huber-Warco motor graders is the completely hydraulic cab-controlled blade movement which permits the blade to be moved from 90° on one side to 90° on the other without leaving the cab. There are no manual adjustments.

A power sliding moldboard is standard equipment on the 5D-190—there's no deviation from the line of travel. Other important features include: full 360° blade rotation without removing scarifier teeth; four wheel brakes are standard; high front and rear axle clearance; wheels and tires are interchangeable; and all controls are within easy reach of the operator.

Other Huber-Warco torque converter grader models include the 6-D and 7-D series. Models with standard transmission include the 4D-75, 4D-85, and 4D-115. For a demonstration—see your nearest Huber-Warco distributor.

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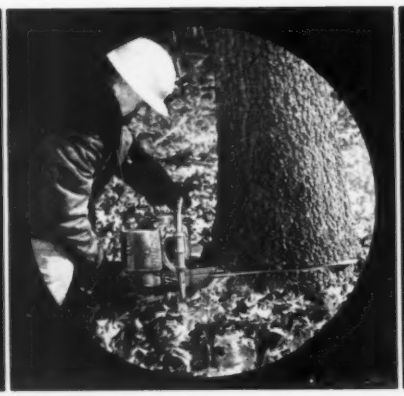

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broad, flat tie-bearing surface won't cut ties

This picture shows how you can make your ties last longer. That's a True Temper BULLDOG rail anchor applied to a test track at our Lake City, Pa., plant.

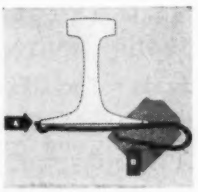
Note that the part of the anchor which bears against the tie (white area in photograph) is *broad* and *flat*. The load is distributed evenly over a wide area of the tie. The anchor doesn't cut into the tie, doesn't give decay a place to start. Ties last longer when you use BULLDOG anchors.

The new BULLDOG has at least *25% greater holding power* than our previous anchor, which itself was noted for high anticreep properties. It will retain that high holding power through years of pounding main-line service.

Can't injure rail in derailment

Here's another important way BULLDOG anchors protect your right of way. In the event of a derailment, the anchor is designed so it won't damage the rail. The ear of the anchor merely bends over.

BULLDOG cannot damage the rail under a derailed wheel. Ear merely bends over. (Top view.)



BULLDOG grips by tension (A) and compression (B), has 25% more holding power.

BULLDOG anchors give you the great advantages of a two-piece design. However, they are shipped as one unit (in handy 10-anchor bundles) and applied as one unit, by one man, using any striking tool. The anchor fits new or worn rail and can't be overdriven.

All leading makes of rail anchors are worthy products that improve track maintenance. But we believe the BULLDOG gives you advantages found in no other anchor. Learn more about it—write for our brochure and/or have a True Temper representative call on you. True Temper Corp., Railway Appliance Div., Cleveland 15, Ohio.

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25% greater holding power . . . one unit . . . applied by one man . . . using any striking tool

Subject:

Dear Readers:

RAILWAY

TRACK and STRUCTURES

"Selling" Your Ideas

Nearly all of us have had this experience more than once: An idea occurs to us that we feel will be of benefit to our employer. It may involve a more efficient machine or device, an improved method for doing a particular job, or a change in company policy. We place it before a superior or someone else in authority. Nothing happens! That is, right away. But later we find the idea has been adopted and put into practice.

It is natural to react with frustration and resentment to an experience of this sort. We feel that we have been cheated or victimized. But J. M. Symes, president of the Pennsylvania, is outspoken in his belief that creators of ideas frequently have only themselves to blame when their suggestions fail of adoption. Mr. Symes' opinions are contained in this excerpt from his annual talk to the regional officers of the road, published in the March issue of the Pennsy Magazine:

"I have been with this railroad 40 years—and I can say during that time I have seen many good ideas advanced by rank and file employees and by officers of the company. Many ideas have been adopted—many have not. The reason for many ideas not having been adopted was because the originator of the idea did not have enough sales ability to put it over to his superior officer.

"I have heard many times—and you have too—where an officer or employee of the company will tell you that the new idea we are now putting into effect was advanced by him many years ago. I don't have too much sympathy for some of those people; as a matter of fact, in too many cases they have failed. The creator of ideas without the ability to make them realities because of 'selling inability' should devote more of his time to 'selling' in the first instance."

Let us note first that Mr. Symes does not imply that, in his opinion, the creator of an idea is *always* to blame when it is not adopted. We can all understand that situations will be encountered where the "sales resistance" is too great to be overcome, even by the most aggressive and convincing salesmanship. Even so, we must agree with Mr. Symes that new ideas must be "sold." This is so because the adoption of a new idea means the displacement of an established practice or policy. The "old way" must have merit or it wouldn't have been adopted in the first place. Therefore, it is necessary to prove that your idea is better than the one now in use.

How do we go about "selling" an idea to our superiors? Basically, it is merely a problem of assembling the facts and arguments needed to prove its superiority and then presenting this material in the most effective manner to the person or persons who must pass on it. In most cases it will be necessary to incorporate the argument in a memorandum.

In suggesting a new idea an employee generally is trying to better his position by doing something that will help the company. Therefore, it is in the interest of management to encourage employees to make suggestions, that is, to create a "climate" in which employees will feel that every idea will be given serious consideration. Under such conditions, meritorious ideas presented in accordance with proven "sales" techniques will have more than an even chance of being accepted. MHD

Just published

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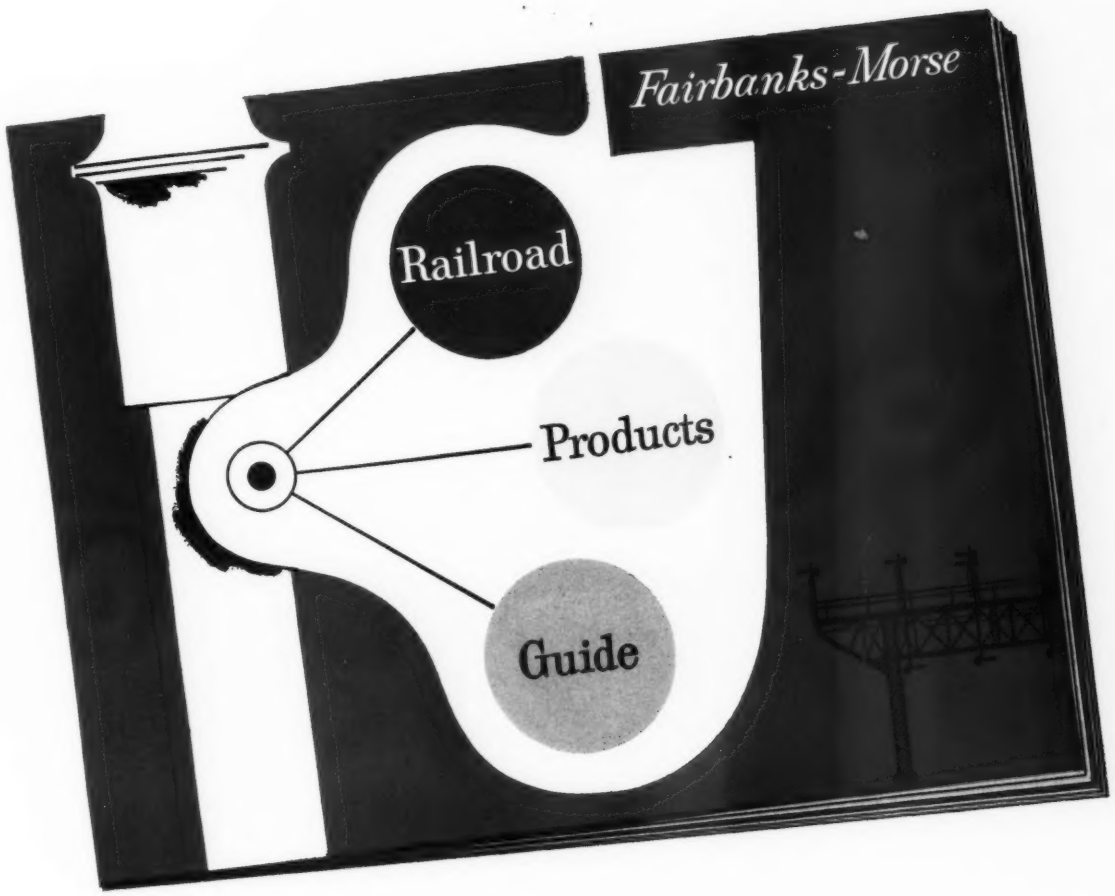

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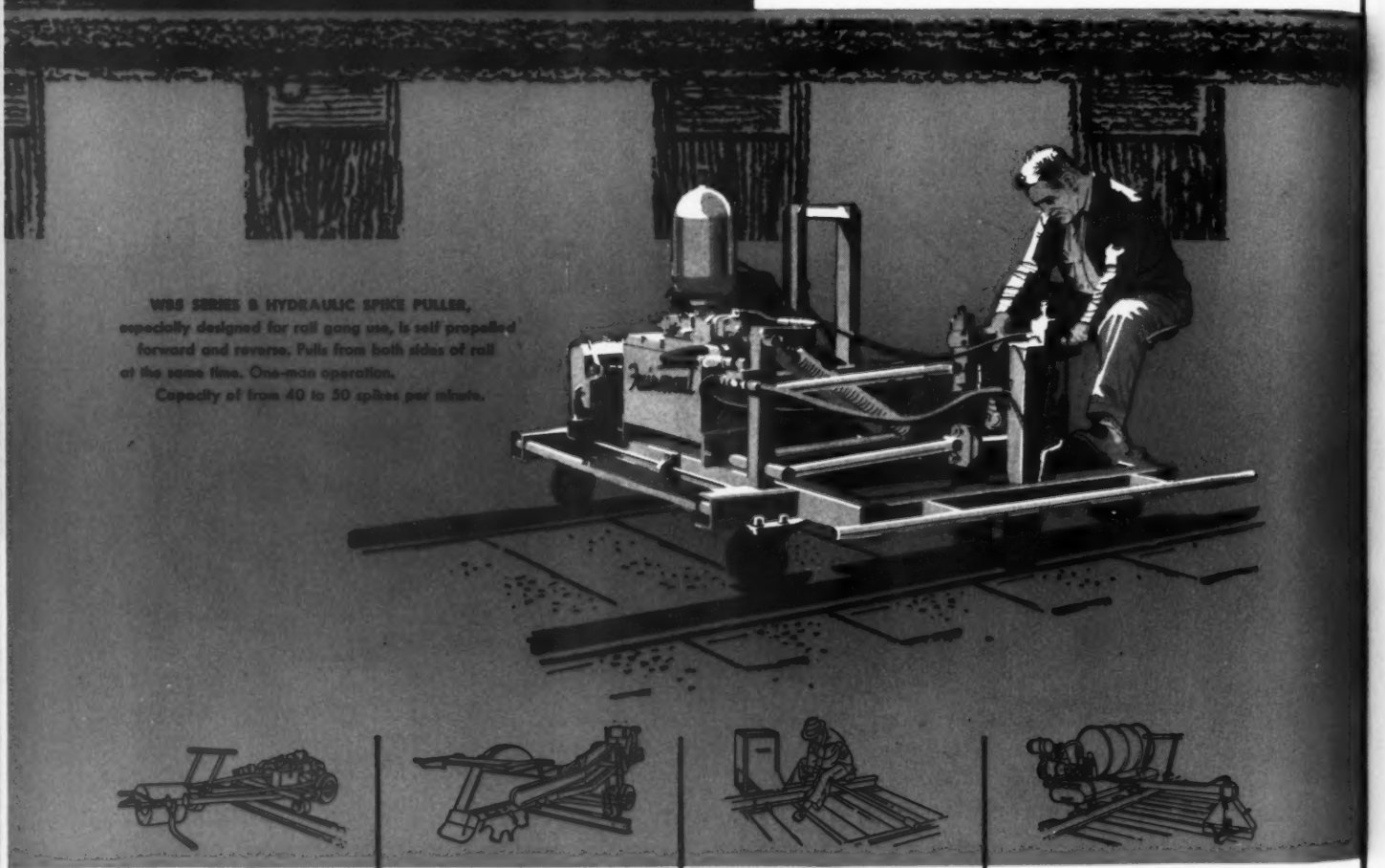

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RAILWAY

TRACK and STRUCTURES

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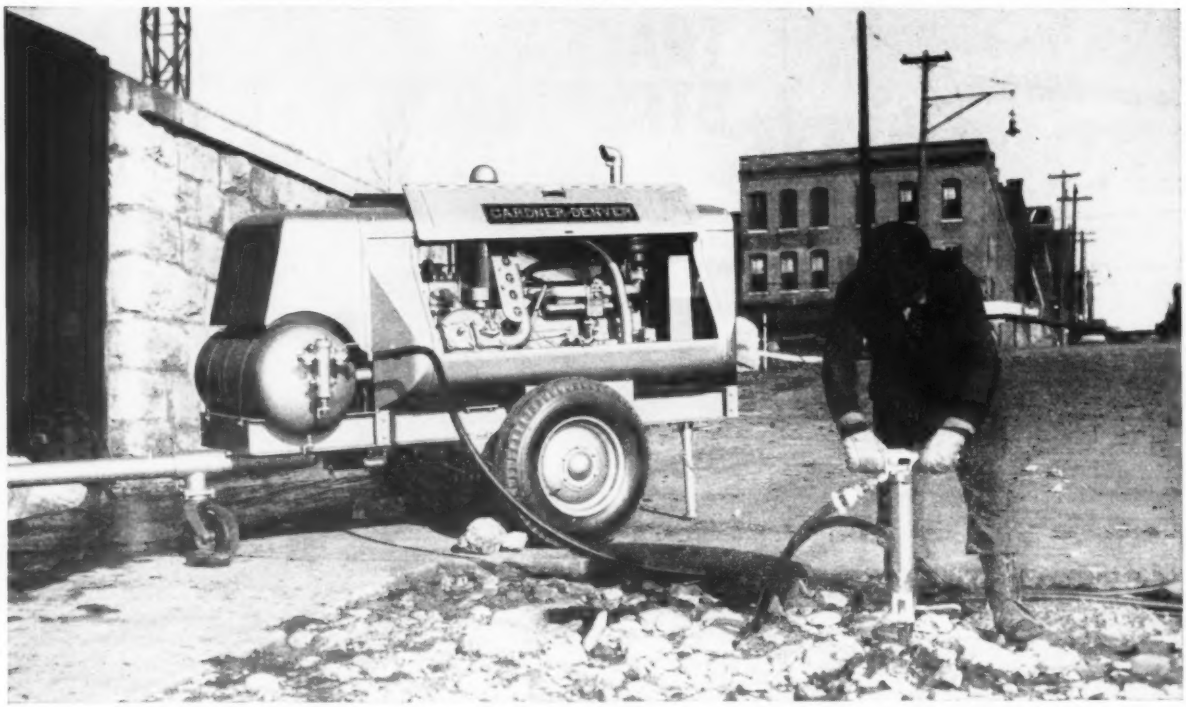

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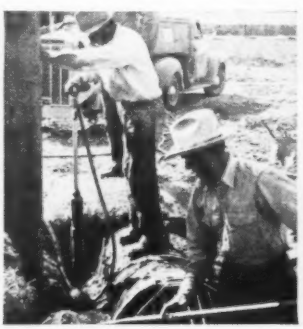

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More Staff Meetings Needed

Communication between management and employees is recognized generally as an important factor in the successful operation of any large business. Where good communication prevails, the employees know what management is trying to accomplish, and management is aware of the thinking of its employees. The net result is harmony in purpose and action.

Various means are employed to effect this communication. It may be done through monthly magazines, through letters, and through conferences. Many of the more successful concerns employ all three means, but railroads in general use only the first two.

Many railroads have not adopted the conference means of communication principally because of the long distances which must be traveled by some of the men who normally would be requested to attend. But a conference provides an excellent opportunity for management-employee communication; also its use will eliminate a large amount of correspondence.

A few roads have adopted the conference as a means of communication by holding staff meetings from two to four times a year at their headquarters or some other convenient location. Some are attended by the division officers from the entire system, with the president as the presiding officer, while others may be attended by the division engineers only, with the chief engineer as the presiding officer.

At such meetings the views of management are made known, and sometimes the management obtains firsthand reports of the work underway on the divisions. Railroads that hold such meetings report they are mutually beneficial.

Another version of the conference idea is the holding of monthly staff meetings at the division level, with either a general officer of the road or the division superintendent serving as management's representative.

It Pays to Keep Trying

The fact that some people don't respond when they are treated in accordance with the principles of good human relations is no excuse for discarding these principles. This point, made in an address at the AREA convention last month by William E. Cornell, engineer of track of the Nickel Plate, cannot be emphasized too strongly.

"You sometimes hear a man say you can't teach a man to handle men because they are all different," said Mr. Cornell. "I'm certain the situation is not that hopeless. Certainly all men are different but their differences in this respect fall into two main classifications, one major and one minor—the conformist and the nonconformist— on a ratio of about nineteen to one. . . . The late Dale Carnegie said that 95 per cent of all people respond favorably to the principles of good human relations and for the other 5 per cent you could use a baseball bat. . . . Granted that you figuratively have to kick one out of twenty men—is that any logical reason why you should lose the improved performance of nineteen.

People are sometimes prone to judge the validity of a new concept on the basis of one or two personal experiences.

A hasty judgment made on the basis of such meager evidence would be a tragic mistake. We don't know the authority for Mr. Carnegie's comment to the effect that 95 per cent of all people respond favorably, but we know that the proportion is pretty high. Countless studies made by research groups confirm this statement. So let's not be discouraged if we experience a failure or two in the beginning.

The AREA Convention

As Seen by *RT&S* Cameramen

Photographs tell story of large attendance at annual meeting, with representation from far corners of this country and Canada. Some new program features were introduced this year.

President O'Rourke addresses meeting.

● On the assumption that people make news, we present on these pages plenty of "news" about the American Railway Engineering Association convention held last month at the Palmer House, Chicago. The photograph at the right shows the Grand Ballroom of the hotel—or as much of it as could be caught by the camera—on Tuesday morning, March 13, the opening day of the meeting. All the other photographs were taken at random in the foyer and corridors.

This pictorial record of those in attendance is impressive in that it

(Continued on page 46)

The New Officers

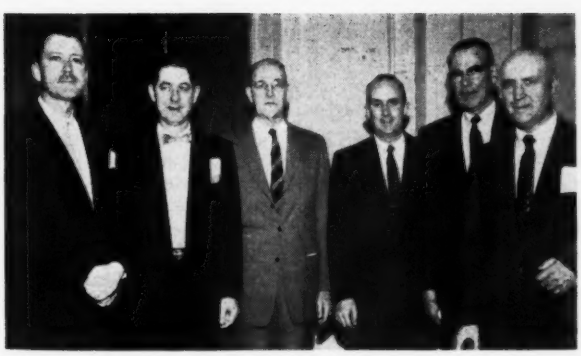
Results of the election of officers were announced at the AREA annual luncheon on Wednesday, March 14. The new officers are: President, Wm. J. Hedley, assistant chief engineer, Wabash, St. Louis; vice-president to serve two years, B. R. Meyers, chief engineer, Chicago & North Western. Ray McBrian, engineer of standards and research, Denver & Rio Grande Western, and a vice-president of the association, was automatically advanced to senior vice-president.

The directors elected are: G. H. Echols, chief engineer, Southern System, Washington; R. R. Manion, chief engineer, Great Northern, St. Paul; L. A. Loggins, chief engineer, Texas & New Orleans, Houston; and W. G. Powrie, chief engineer, Milwaukee Road, Chicago.

Members of the nominating committee are: A. V. Johnston, chief engineer, Canadian National, Montreal; J. C. Jacobs, engineer maintenance of way, Illinois Central, Chicago; A. B. Stone, chief engineer, Norfolk & Western, Roanoke, Va.; W. C. Pinschmidt, engineering assistant to vice-president, Chesapeake & Ohio, Richmond, Va.; and W. M. Jaekle, chief engineer, Southern Pacific, San Francisco.

E. J. Brown, Burlington; H. B. Christianson, Milwaukee; E. Turner, Kershaw Manufacturing Co.

W. H. Giles, Missouri Pacific; H. Kranz, Michigan Tractor Co.; J. M. Giles, Caterpillar Tractor Company.



F. H. McGuigan, M. A. Wohlschlaeger, L. M. Ogilvie, J. W. Dolan, R. E. Peck, T. G. O'Neil—all of the Missouri Pacific.

Turn page for more pictures →

H. T. Seal, Chesapeake & Ohio; L. Flinn, R. A. Carr, and Ernest Konigsmark, Dearborn Chemical Company.

R. A. Ulery, Bessemer & Lake Erie; M. S. Norris, Baltimore & Ohio.

H. F. Smith and S. E. Haines, Jr., both of the Reading.

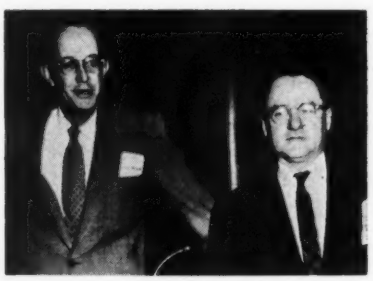
J. R. Bowman and J. W. McMillen, Terminal Railroad Association of St. Louis.

C. W. Hanson, A. F. Ewert and T. A. Blair, all of the Atchison, Topeka & Santa Fe.

C. F. Thomas, Spokane, Portland & Seattle; R. J. Klueh and M. L. McCauley, New York Central.

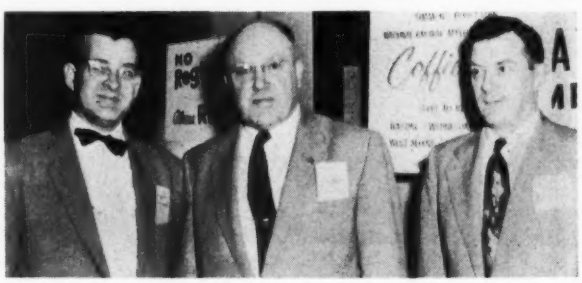
W. H. Giles, Missouri Pacific; W. J. Hedley, Wabash.

L. P. Drew, Union Pacific; A. B. Stone, Norfolk & Western.



M. B. Allen, Nickel Plate; W. M. S. Dunn, Chesapeake & Ohio.

W. B. Tittsworth, Jr., R. E. Von Sprecken, C. A. Stokes and A. R. Dahlberg, all of the Western Maryland.



J. W. Crossett, International Nickel; R. W. Gustafson and R. E. Grieder, Great Northern.

indicates railroads from all parts of this country and Canada were represented. From a statistical standpoint the attendance was equally impressive. A total of 2,092 persons registered at the meeting, including 1162 members and 930 guests.

Movie Theater Introduced

The proceedings this year were marked by an interesting—and surprisingly popular—new feature. Past experience had indicated that a rather large number of members arrive in Chicago on Monday of the convention week, even though the meeting itself does not start until Tuesday. During exhibit years, these early arrivals have an opportunity to inspect the exhibit before the convention opens. But officers of the association recognized that during non-exhibit years there was a need for some other activity on Monday.

The result was the introduction this year of a pre-convention moving-picture theater. Beginning at 9:00 a.m. on Monday, March 12, a series of moving pictures of special interest to railway engineering and maintenance men was shown in the exhibit hall of the Palmer House, continuing all day except for a break at lunch. Along with the movie theater there was a "coffee bar" sponsored by the Simmons-Boardman Publishing Corporation and the National Railway Appliances Association. Fruit juices, rolls and coffee were served in the

A. W. Wells and R. T. Johnson, both of Mid-West Forging & Manufacturing Co.

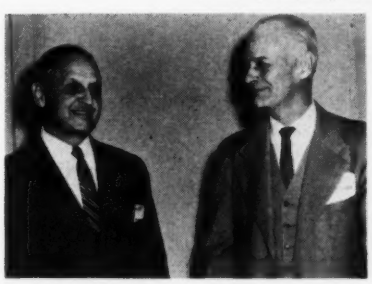
A. H. Whisler, Speno Railroad Ballast Cleaning Company; D. E. Rudisill, PRR.

M. A. Dysinger, Southern; R. R. Gunderson, Western Maryland.

R. B. Hill, Racine Hydraulics; O. E. Fort, Frisco; C. W. Christianson and W. F. Swan, also of Racine Hydraulics.

R. E. Paulson and B. O. Johnson, both of the Milwaukee; R. M. Jenner, Railway Maintenance Corp.

F. L. Etchison and C. L. Robinson, Western Maryland.



L. E. Gingerich, Pennsylvania; J. S. Miller, Athey Products Corp.

J. Marsh, Deleuw-Cather & Co.; H. E. Durham, AAR.

W. S. Williams, I C; H. L. Holderman, Bird & Son; R. B. Radkey, H. F. Longholt, A. A. Mulvey and P. A. Cosgrove, Illinois Central.

W. L. McDaniel, Massey Concrete Products Co.; G. L. Staley, Katy; E. J. Ruble, AAR.

morning, and there was coffee in the afternoon. As in past years, the morning "coffee bar" was continued throughout the convention.

The attendance at the pre-convention movie theater exceeded all expectations. Before the convention, Executive Secretary Neal D. Howard expressed the hope that perhaps 300 would appear at the movie theater. Actually, a total of 862 persons registered on that day, including 497 members and 365 guests.

Moving along as usual with clock-like precision the convention program this year followed pretty much the same pattern as that for recent years. The reports of the association's 23 standing committees were supplemented by about 15 special features, including addresses, moving pictures and slide presentations. All sessions of the meeting were directed by George M. O'Rourke, president of the association, and engineer maintenance of way of the Illinois Central, assisted by Executive Secretary Neal D. Howard and vice-presidents Wm. J. Hedley, assistant chief engineer, Wabash, and Ray McBrian, engineer standards and research, Denver & Rio Grande Western.

More Pictures ⟶

The annual luncheon was again the single organized social event for the members as a whole. The principal speaker at the luncheon was Wayne A. Johnston, president,

At the "Coffee Bar"

A popular gathering place throughout the convention was the "coffee bar" sponsored jointly by the Simmons-Boardman Publishing Corporation and the National Railway Appliances Association. Most of the pictures on these two pages were taken on Monday, March 12, at or near the coffee bar which was adjacent to the pre-convention movie theater. The others were taken after the convention started.

V. R. Cooledge and G. E. Stewart, both of the Southern Pacific.

A. W. Harper and L. G. Wean, both of the Milwaukee.

J. R. Thompson, *RT&S;* W. B. Blix, Nordberg Manufacturing Co.; M. B. DeWire, T. F. Scholes, Inc.; H. R. Dunlop, *RT&S.*

B. J. Worley, Milwaukee; H. Rutledge and R. Kershaw, Kershaw Manufacturing Co.

H. R. Peterson, Northern Pacific; E. S. Birkenwald, Southern.

A. P. Crosley, Reading; W. E. Campbell, Linde Air Products Co.

L. V. Johnson, Soo Line; G. W. Miller, Canadian Pacific.

D. W. Hughes, Michigan Public Service Commission; C. J. Hartsell and M. I. Dunn, Chesapeake & Ohio.

M. G. Counter, Burlington; L. T. Burwell, Rails Company; J. F. Schnell, Erie.

Illinois Central, whose subject was "The Ever-New Challenge of Railway Engineering."

A shift of emphasis is seen by Mr. Johnston from the "rough and ready engineer" required during the era of railroad construction to engineers capable of solving a wider variety of problems. The engineer of the future, he said, will in some ways "have to be a better engineer than his father and his grandfather before him." He will "face problems of human relations far more complex than those faced by his forerunners. The new engineer will need the same qualities of self-reliance, loyalty and dependability possessed by the engineer of the past, but in addition he will have to possess skills beyond sheer engineering. He will, for example, need to know how to handle men in a way that was not known (or at least not generally practiced) in the past. In this day of intense competition between companies, the difference in manpower is often the difference between success and failure."

The matter of human relations was the subject of two other addresses presented during the regular sessions. With "Building People" as his subject, Harvey C. Marmaduke, consultant, management-employee relations, outlined five lessons to be learned by those who are promoted to supervisory positions and therefore find it necessary to become interested in people rather than in just a single

J. A. Holmes, V. R. Cooledge, F. M. Lathrop, E. O. Williams and G. E. Stewart, all of the Southern Pacific.

H. A. Robandt, Kalamazoo Mfg. Co.; B. C. Davidson, Frisco; E. F. Turner, Kershaw Mfg. Co.

C. E. DeGeer, J. B. Mitchell and W. F. Arksey, all of the Great Northern.

H. E. Snyder, Toncan Culvert Mfrs. Assoc.; Wm. J. Hedley, Wabash; E. R. Englert, Louisville & Nashville; W. H. Huffman, Chicago & North Western.

J. J. Schnebelen, Mo Pac; R. E. Catlett and B. H. Crosland, Frisco; G. Achuff, Achuff Railroad Supply Co.

E. G. Gehrke, AREA; W. R. Wilson, Santa Fe; J. S. Hancock, Detroit, Toledo & Ironton.

L. R. Martilla, L. W. Haydon and D. G. West, all of the Detroit, Toledo & Ironton.

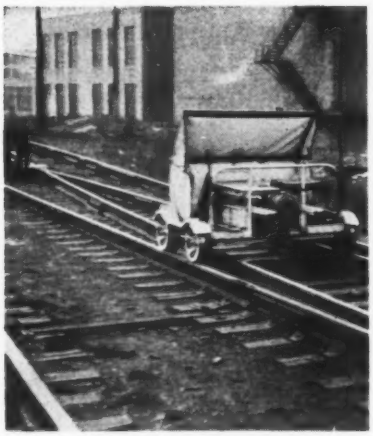
J. Largent, Missouri Pacific; R. J. Moe, Electric Tamper & Equipment Co.; B. E. Pearson and I. Holberg, Duluth, South Shore & Atlantic.

phase of the job. These lessons are: (1) Study subordinates; (2) be human and considerate of others—learn to like people; (3) delegate responsibility; (4) let others in on plans—tell them the hows, the whys and the wherefors; and (5) make people want to do things.

Fear or Leadership

The third speaker on this subject was W. E. Cornell, engineer of track, Nickel Plate, whose title was "Better Human Relations as a Key to Improving Maintenance of Way Work." "It is axiomatic," declared Mr. Cornell, "that nothing can be accomplished satisfactorily by a group without cooperation of some sort. In broad terms there are probably two methods of obtaining cooperation. One of these can be classified under the heading of fear—fear of physical or mental abuse or economic fear, that is, fear of loss of job. The other, and by far the most effective way to obtain the necessary cooperation, is by principles of good leadership. It has been well established by studies and practical observations that there can easily be a difference of as much as 50 per cent or more in the results obtained between these methods of getting cooperation, depending on how closely the fear-driven cooperation can be supervised. If anyone has that much supervision they should lay off the men and put the supervision to work."

Watch that Motor Car . . .



MOTOR CAR left within turnout is hard to remove from the track. But . . .

. . . WHEN PARKED at either end of the turnout during inspection, the motor car can be removed from the track in a few seconds should a train approach.

How to Make a Track Inspection

Part II

By L. C. Blanchard
Roadmaster
Milwaukee Road
Minneapolis, Minn.

In the second of two installments, the author tells what to look for when inspecting turnouts, highway crossings, and around bridges and culverts. He also outlines the patrolman's responsibility, deals with the frequency of patrolling, and mentions supplementary inspections.

● Of very great concern to the track inspector is the condition of the turnouts on his beat. When patrolling with a motor car it is best to stop and walk the entire length of each turnout. A switch is the weakest link in the track structure and requires very careful checking. Start at the switch stand and note whether it is solid on the headblock ties. Unlock and throw the switch to determine whether it throws easily and whether the points fit properly. Check all bolts from where the connecting rod attaches to the crankshaft of the stand down through the whole sequence of rods and clips. See that every nut is tight and protected with a cotter key.

The switch points should close firmly, but not so tight as to cause a *kick* in the switch handle. If the switch is provided with a cam lock see that it is clear of the ties or switch clips, and has free movement. Check the switch braces for fit and replace any broken slide plates. Make sure that all heel filler bolts are in place. This is particularly important because the switch point is not spiked down like the other rails. If it should get loose at the heel there would be nothing to hold it in place.

Check the turnout rails for good track gage. Track is especially subject to spreading in a turnout because too often a locomotive will proceed through the turnout at a speed greater than that for which the turnout was designed. So check it carefully. Observe whether the wheels are striking the point of the frog and wearing it more on one side than the other. If they are, this indicates that the guard rail is not doing its job. More about guard rails later.

Look Frogs Over Carefully

Inspecting a spring-rail frog is a little more complicated than inspecting the rigid or self-guarded types. Make sure that the spring wing opens properly and that the hold-downs do not have excessive clearance. It is of the greatest importance that the switch ties under the heel and toe of a spring frog be of sound timber, because any rocking motion in the frog will have a lifting action on the wing rail. Should the hold-downs be a little loose in such instances, the wing has been known to lift high enough to be caught by a car wheel which, instead of rolling up on top of the wing rail as it should, forces the wing rail sideways, bending and spreading it until a derailment occurs.

During wet weather, frogs are more subject to pumping than other parts of the track. For that reason they should be provided with good ballast and be well drained. The flexing or up-and-down motion of a pumping frog will cause the parts to crack and break and the bolts to become loosened. When it is observed that a frog is pumping, it should be retamped and the ballast renewed if necessary.

Guard Rails Subject to Strain

Guard rails are designed to hold the wheels of a train in their proper relationship to the flangeway

Turnout Inspection . . .

BOLTS at heel of switch should be in place or point can become detached.

SWITCH BRACES should be checked for proper fit. Also, all bolts must be kept tight, with cotter keys inserted where they are required.

GUARD RAILS must hold wheel in proper relationship to the frog. Hence, the bolts and braces must be kept tight.

TRACK GAGE should be maintained at the point of frog, otherwise the effectiveness of the guard rail is reduced.

through the frog. They must be properly installed in accordance with the standard plans of the railroad. Since they are subject to considerable strain they must be inspected frequently. Bolts and braces must be kept tight. When spring washers are used on guardrail bolts they should be watched closely as they sometimes break and permit the bolts to become loose.

Replace Worn Guard Rails

The track gage should be maintained at 4 ft 8½ in at the point of frog. It is not too uncommon to find the gage ¼ in or more tight at this point, and that reduces the effectiveness of the guard rail. Somewhat the same effect is achieved when the guard rail becomes worn and the evidence is severe wear on the point of the frog. Worn guard rails should be replaced. When that is not immediately practicable, a temporary remedy can be effected by spiking the rail opposite the point of frog so that the gage is wide an amount equivalent to the wear of the guard rail.

While inspecting a turnout, it is not good practice to leave the motor car standing at any point between the switch stand and the frog. Regardless of how good the line-up or train information is, there is always the possibility of a train approaching unnoticed. It takes only from five to ten seconds to remove a motor car from the track if it is outside of the turnout. Because of the four rails it is just about impossible to remove a motor car from the track when it is within the turnout, and the time it takes to push the car out of the turnout can be disastrous. Likewise, if one is faced with the necessity of getting the car in the clear quickly, it takes much less time to remove the car from the track than to push it through the turnout onto a siding. Many good foremen have learned this the hard way.

Line Switch Before Leaving

Finally, before leaving the switch, make sure that it is properly lined for main-track movement and is securely locked. To make doubly certain, leave the motor car outside of the switch at the end where it will be necessary to make a main-line movement through the switch when pulling away. You will understand why I make this suggestion if you have ever gone down the track two or three miles and then began to worry whether the switch was

left properly lined and locked.

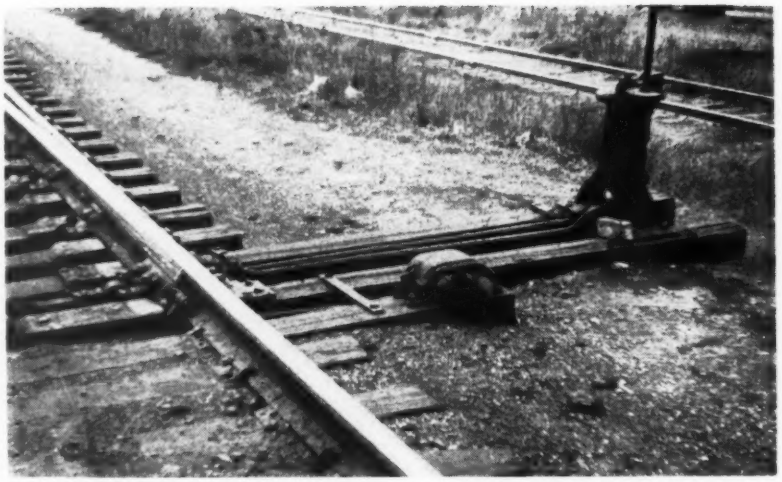
Depending on the type of territory, someone is assigned to look after the switch lights. If the light is found to be out it must be relighted but, before doing so, make certain that there is oil in the fountain, the wick is long enough, the carbon is cleaned out of the burner, and the wick is trimmed. After relighting wait a few moments for the flame to reach its normal height, otherwise it may run up and smoke the lamp because of being too high. After the flame is adjusted, sight through the outer lenses of the lamp to see whether the flame is properly centered in the lamp. These lenses are made to magnify the flame on the wick, but can only do so when the flame is centered.

Next, replace the lamp on the switch stand and check for alinement with the track. Many do this by sighting the target on the switch stand. That however, is not accurate enough. A switch lamp throws a beam of light similar to the field of vision when sighting through a telescope, or such as the beam of a flashlight. To be effective this beam should strike the locomotive engineer in the eye.

One way to accomplish this would be to climb a step ladder about 20 ft from the switch stand and out from the rail the same distance as the switch stand is from the rail. Place your eye on a level with the bulls-eye of the switch lamp. Then have some one twist the target staff until the light beam comes into proper alinement with the track.

Since track patrolmen do not ordinarily carry step ladders, there is a simple trick that can accomplish the same result. Stand back about 20 ft from a high switch stand and the same distance out from the track. Look up at the bulls-eye on the switch lamp and, if you note a shiny wedge of light pointing at six o'clock, it is right. In other words if you were now to climb a step ladder the wedge of light would move up into the center of the bulls-eye as it should be.

Let us suppose that you found the wedge of light pointing at 12 o'clock. This would mean the light beam was tangent to the main track but was pointing into the ground on one side and into the sky on the other side. Suppose the wedge of light pointed at 3 o'clock. This would mean the light beam was crossing the track on one side and going away from the track on the other side. One can prove any of these things by simply walking around the switch until he finds where the beam strikes.



AFTER INSPECTION, make sure that switch is locked for main-line movement so its position will not be a source of worry when you are a few miles away.

Highway crossings must have a share of the patrolman's attention. It is not enough that they be safe for railway traffic; they must be safe for highway traffic as well. The weakest part of a highway crossing is the rail joint in the crossing. The bolts must be kept tight and the angle bars will need to be replaced more often than on joints outside of the crossing. Many roads have eliminated joints in highway crossings by ordering rails in special long lengths or by welding the joints.

Check Flangeways

Check the mud rails (the rails laid on their sides to form a flangeway) to see that they are solid in the crossing. A loose mud rail can be exceedingly dangerous. While freezing weather is in progress watch for heaving plank. During wet weather highway traffic will quickly gouge out deep chuck holes in many types of crossings. Serious damage can result to tires and car springs.

Highway crossings are a prime source of rail failures due to head-and-web separation. This condition is not always visually apparent. One way to check on this type of failure is to use a common nail hammer and sound the rail by tapping along the top surface. A dead sound in a certain area will indicate a separation is taking place.

Bridges Require Attention

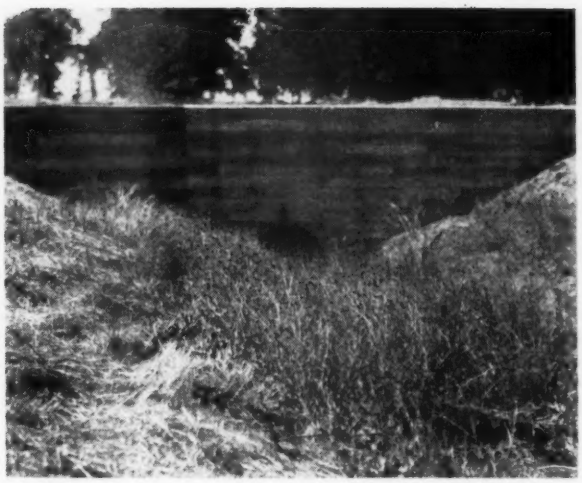
While the responsibility for bridges is largely with the bridge and building department, the track patrolman has a responsibility for them also. Among the most troublesome spots at bridges are the approaches. Unless properly stabilized, ties will frequently be found hanging and in need of tamping, especially the first five or six ties off the bridge. Besides causing rough-riding track, such a condition puts an added strain on the bridge. In addition, anytime there is a constant flexing of the rail over loose ties, there is danger of the rail breaking. So watch the bridge ends carefully.

Many bridges have water barrels placed on them for use in the event of a fire. It is the patrolman's responsibility to know that these are kept filled and have a fire bucket available for instant use. If he does not have the time to keep these barrels filled, he should at least report the condition to his superior. Also, he should observe the conditions under the bridge for fire hazards and also for the obstruction of the flow of water. Any unsafe or unusual condition that he might observe should be reported to his superior.

Inspect Culverts Often

Culverts should be examined frequently and especially following heavy rains. Look through them to note whether there is any leakage of dirt or ballast from above. Track is sometimes washed out because of scouring around the ends of the culvert and, if there are any signs of this, it should be reported so that rip rap can be placed for protection. Culverts frequently fill up with dirt because the ditch on the downstream side is higher than the bottom of the culvert. In such cases

RAILROAD CROSSINGS should be inspected daily and with care. All bolts should be kept tight and broken ones replaced.



CULVERTS should be examined frequently, and especially after heavy rains, to be sure they are functioning properly.

the outlet ditch should be deepened, after which the culvert will become self-cleaning.

Must Know Instructions

To increase competence and know-how, the supervisor should furnish the patrolmen with copies of pertinent rule books and other current instruction pamphlets. Also the patrolmen should be furnished with copies of the railroad's standard plans for turnouts, track signs, motor-car set-offs, highway crossings, right-of-way fences and any other material that will increase his knowledge of what is correct. Through such knowledge he can fit himself for the greater responsibilities and opportunities that await him.

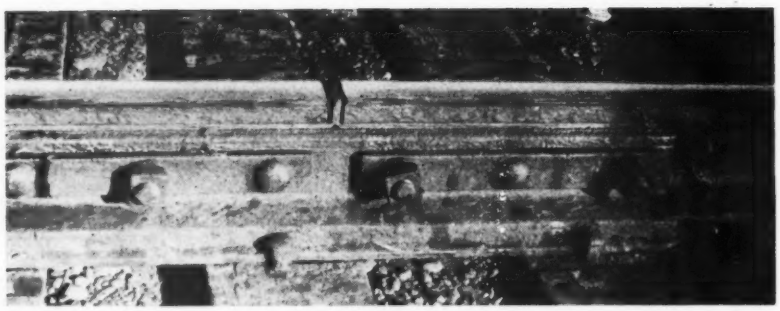
Supervisors should provide track patrolmen with a statement concerning their duties and responsibilities. Presented with this article is a statement that could be revised and made applicable to any set of conditions. It should be posted for ready reference at the patrolman's headquarters, and he should have his attention called to it from time to time to the end that he will not become careless through over familiarity with his territory.

Frequency of Patrolling

How often should track be patrolled? This is a question that has plagued management since the beginning of railroading and has now been intensified by the five-day week. We have had the five-day week with us for quite some time and while some railroads have settled the matter of patrolling to their satisfaction, others are still

Responsibilities and Duties of Track Patrolmen

1. **The track patrolman is responsible for the detection and correction, or reporting to his superior, of defects found in rails, fastenings, surface, line, gage, turnouts, and any other parts of the track structure.**
2. **He is responsible for the detection of all unsafe conditions within the right-of-way limits. It is not enough that he see them—he must take some action concerning them. Either he must correct the defect immediately, make arrangements to have it corrected, report the condition to his superior for correction, or in an emergency take the proper action to insure the safety of trains, either by flagging, by a slow order, by a look-out order, or whatever action may be required.**
3. **All broken track, switch and other turnout bolts are to be replaced each time track is patrolled. All switch, frog and guard-rail bolts must be kept tight and cotter keys inserted where they are required.**
4. **Main-track turnouts are to be given a careful walking inspection at each patrol and any defects promptly repaired. See that foot-guard blocking is in place and ties are properly spaced to avoid interference with cam locks and switch rods.**
5. **A track policeman should inspect and relight switch lamps during his tour, regardless of whether a regular lampman is employed. Any defects in switch lamps should be corrected or reported.**
6. **Insulated joints must be inspected frequently and kept properly tamped to good surface. The patrolman should see that abrasion plates are in place and that ties are properly spaced. When necessary, he should replace insulation and arrange to have joints slot-ground with a cross grinder. Also, he should report any defect such as a loose bonding wire.**
7. **All roadway signs should be checked to see that none is missing, and that they are readable and standing straight. A leaning track sign is most unsightly.**
8. **Hanging ties at bridge ends must be kept tamped to a firm bearing. The patrolman should renew cracked or broken angle bars, correct wide gage, joint-up dangerous rough spots in track, install an occasional crosstie where needed for safety and do any such corrective work that can be handled by himself and a helper.**
9. **Brush that endangers engineman, trainmen or communications must be kept cut or trimmed to clearance point.**
10. **Foremen are responsible for the training and supervision of the track patrolmen and are responsible for following up and correcting defects reported by the track patrolman. Also, foremen should ride with the track patrolmen frequently enough to be assured that instructions are being carried out.**



INSULATED JOINTS should be inspected frequently and, when necessary, the patrolman should replace worn insulation.

wrestling with this problem.

For many, many years prior to the five-day week, section foremen were instructed to patrol the track once a day for six days each week. Track was not patrolled on Sunday unless a special condition existed. Prior to 1930, section foremen did, on the whole, patrol once each day of the work week. There was an occasional slip. From 1930 to 1949, as track became heavier and of better quality, foremen and others began to reason that, if it was safe not to patrol on Sunday, track patrolling could be omitted a day now and then during the middle of the week. Since no harm seemed to result from this practice and more constructive work could be done on the days no patrolling was done, many foremen slipped into a pattern of every-other-day patrolling.

As of today, there is a wide variation in patrolling intervals among railroads, and even on divisions of the same railroad, ranging from every-day patrolling to twice-a-week patrolling. On some portions of railroads where hazards or unstable conditions exist, such as rock slides, water pockets in fills, frequent sun kinks, an excessive number of broken rails or joint fastenings, or the possibility of freak storms causing damage, there is need for daily or frequent patrolling. There are other portions of the railroad that have been relatively well stabilized and protected by electrical devices which largely eliminate the need for such frequent patrolling.

When should track be patrolled? If the track is to be patrolled every day or every other day the question is hardly pertinent. If it is to be patrolled twice each week, then it would seem that Monday and Friday would be the logical patrolling days for the reason that some incidental patrolling would be bound to occur during the middle of the week.

In addition to the regular track patrol there are many supplementary track-inspection services available to the railroads. On many railroads it is a regular practice for inspection parties, made up of division forces, to cover the entire system at least once each year while inspecting bridges, culverts and waterways. Each party is usually made up of a bridge and building supervisor, a division engineer or a bridge engineer, and a track supervisor, with other necessary help from the bridge-and-building department. Such a group makes an ideal track, as well as bridge, inspection party as both the B&B supervisor and the track supervisor have many interrelated jobs to handle. Also, this inspection trip affords a good opportunity for the track supervisor and the division engineer to check the work of the track forces and patrolman.

Other track inspections are made by the track supervisors. These men make frequent riding inspections over the tracks, riding on motor cars, locomotives, rear ends of passenger trains, cabooses and in baggage cars, all for the purpose of determining how the track is riding under each type of equipment. Track that is out of line, level or surface is noted as to location, and the track forces are notified to make the required repairs. Broken rails, open joints, damaged fences, stock on right of way, signals not functioning properly, and many other defects are noted on these riding inspections.

In addition to the live inspections, many parts of the railroad are protected by electrical "watchmen." These are the electric circuits which actuate signals to warn trains of impending danger from rock slides, snow slides, burned or washed-out bridges, broken rails, switches improperly lined or points not fully closed, derails not replaced for protection of the main track, trains not fully clear of main track, and bridges being opened to allow for the passage of boats, so that trains are fully protected in addition to, or the absence of, the flagging protection ordinarily furnished by track or train-service employees.

All of these supplementary services back up the work being done by the regular track forces and clearly indicate the intensive character of the track inspection service being carried on by the railroads of today.

Summing up: Because of the heavier, more stable track and better maintenance that has come into existence in recent years, and along with the better methods of inspection and detection now prevalent, we have the safest track structure known in the long history of the railroads.

DAILY REPORTS of the mileage covered, deficient conditions found, and of the work performed, are a necessary part of the track patrolman's duties.

ABOVE—Inspector points to sway brace in need of treatment. RIGHT—All exposed surfaces of the timbers and piles were treated with a penta solution in oil.

How GM&O Plans to Get

More Life from Timber Bridge

● The timber approaches to Bridge MB-73.03, which carries the GM&O's single track across the Black Warrior river between Tuscaloosa, Ala., and Northport, already have given more than 40 years of useful service. But the railroad is expecting to get 5 to 10 more years of additional service from them at a fraction of the cost that would be required to renew the structure. How? By spraying the exposed wood surfaces of all members with a preservative solution and injecting the same solution into the piling under pressure at locations where internal decay was found.

This structure is 3,702 ft long and the timber approaches constitute about 80 per cent of its length. The north approach, 927.5 ft long, was built in 1915 and the south approach, 2,062 ft long, was built in 1914. The bridge timbers and piling are of heavily-creosoted southern yellow pine. The average height of the base of rail above ground is about 45 ft, although in some locations this height is as much as 65 ft. The bents, of six piles each, are 12.5 ft apart and are capped by 12-in by 14-in by 16-ft timbers supporting a creosoted ballasted deck.

Using special spraying equipment for surface work and pressure equipment for internal treatment, the railroad hopes to get 5 to 10 more years of service from the timbers in the long approaches to its Black Warrior River bridge by treating them with a six-per cent preservative solution of penta in oil.

Most of the piling in this bridge is that which was originally driven. A portion of the creosote had leached out and some of the piling had shown signs of heart rot. The bracing and other timbers of this structure had checked considerably and split, accelerating the loss of the original creosote treatment and the entry of fungi.

Treated to Arrest Decay

As a result, the road was faced with the problem of replacing the structure soon, at a cost of approximately $350,000, or of finding some method of arresting the decay. The latter course was decided upon, using a technique developed by the Osmose Wood Preserving Co. of America, Inc., Buffalo, N.Y. This technique consists essentially of thoroughly soaking the exposed surfaces of the timbers with a six-per cent pentachlorophenol-oil solution, jet spraying this soultion into the checks and splits, and boring holes to permit internal treatment of the decayed spots. The preservative is forced into the defective areas under pressure. The Osmose Wood Preserving Company, having the required special equipment, was able to do this work for a small fraction of the original replacement estimate and aimed at an absorption of 0.25 lb of dry pentachlorophenol per cubic foot in the outer half-inch of the wood. The preservative solution consists of six-per cent pentachlorophenol in fuel-oil diluent with special additives to provide long-term toxicity to termites and other insects, as well as to prevent "blooming," or surface accumulation. The work was started late last year and was completed by the end of February.

The special equipment used by the contractor included a 1½-ton truck on which is mounted a 300-gal solution tank. At the rear of the truck is a compartment housing two reels, each with 200 ft of ⅝-in high-pressure neoprene hose; metering equipment; fire-extinguishing apparatus; and a pump op-

WORKMEN used rounded "soaking" heads to apply the preservative solution to the piles. A second treatment is made to compensate for the initial flow-down.

A NOZZLE producing a jet spray is used for sway and cross bracing.

erated from the truck's engine. On each side of the tank are other compartments for the operators' neoprene coveralls, boots, helmets, respirators, gloves, goggles, strap-on spurs and linemen's equipment, and hose nozzles with Fiberglas pipe extensions, as well as necessary tools and testing devices. The contractor also has a large tank trailer for transporting the fuel oil.

Work Done by Three Men

The work on the Black Warrior River bridge was done by a crew of three men who were efficient in the safe use of climbing equipment and experienced in spray application and penetration. Before starting work on any day, the wood was first tested with a moisture detector to be sure that it was sufficiently dry to absorb the preservative solution. If moisture conditions were found to be favorable, the spraymen put on their spurs and safety clothing for preventing skin injuries, and started the day's work. Each man generally worked on two bents during the day. Usually they worked about five bents apart so that the spray of one would not be carried to the other.

How Work Was Done

The piling were first externally treated, and for this work a special "soaking" head was attached to the Fiberglas pipe fixed at the end of the hose carrying the solution. This head is curved to cover about one-third of the circumference of a pile, and has a large number of perforations on its working face to ensure thorough spraying of the area. A hand valve at the hose end of the Fiberglas handle controls the flow of the solution out of the spraying head.

When working on a particular pile the practice was for the sprayman to start below the cap and move the head up and down the pile, soaking it with the solution, then moving around the pile until the entire circumference was thoroughly soaked. This procedure was then repeated a little lower down on the pile. Fiberglas pipe extensions are added when possible to permit working from the ground. A considerable amount of the solution runs down the pile, and is absorbed largely by the wood in the lower portion.

Various Spray Heads Used

After all the piles in the two bents had been treated, the sprayman replaced the soaking head with a jet-spray head and proceeded to treat the caps, sash and sway bracing, and girts. For this operation the workman stationed himself on the adjacent bent and reached over with the extended handle. This permitted a larger area to be covered from any one position. He also sprayed the piling again as he worked himself down to the ground.

When this step had been finished the spray head was changed again, this time to a "fine-spray" nozzle,

UNDERSIDE and sides of ballasted deck, as well as the caps, are first treated with a jet spray for filling checks. A mist spray is used for second coat.

TEST SAMPLES are taken with an increment borer for checking penetration.

and the sprayman again climbed the piling and coated the underside of the ballasted-deck floor, soaking all exposed surfaces of the stringers, deck flooring and ballast retainers. The piling were also given a "fine-spray" coat from these upper working positions. The underside of the deck was given two separate "fine-spray" coats to assure best absorption. It is thus apparent that several applications were made to each pile and that these were augmented by the solution running down the piles during each spraying.

Treating Internal Decay

The practice was for the spraying operations to be continued for a week, with each man spraying two bents a day, weather permitting. The following week was spent treating members for internal decay and taking borings from the members just to determine if the treatment was up to the minimum specifications. This was done with an increment borer. Borings about ⅝ in deep were made. Samples were taken from three sides of each pile and bracing member and sent to the Osmose laboratory for a complete analysis.

To determine the need for internal treatment, the men used hammers to sound the timber. Sound timber gives a solid ring when struck, and hollow spots give a dull sound. When the dull sound was produced, and an inspection of the area showed that the remaining sound wood was strong enough to carry the load, the spot was marked with chalk. Later, a brace and bit were used to bore a hole in the timber to the defective area, after which a hollow bit was hammered into the drilled hole to insure a tight fit, and the six-per cent penta solution was forced into the wood at a pressure of 80 psi until it showed up on the surface of the timber through some check or split. The hollow bit was then removed and the hole closed by driving a penta-treated wood plug into it.

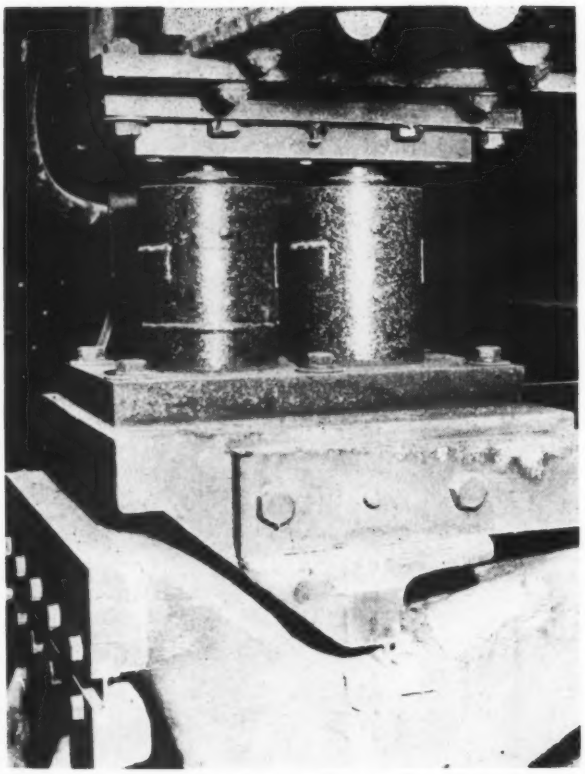
INTERNAL treatment is accomplished by boring a hole in which is driven a . . .

HOLLOW BIT through which the penta solution is forced at 80 psi.

The men took all possible precautions to reduce the hazard of fire to a minimum. All spilled solution, or solution which had formed into pools, was covered with loose earth. One portion of the trestle, which is adjacent to an area where rubbish is burned, was treated with "24-12" fire-retardant penta solution on the lower 20 ft of the bents, instead of the penta-in-oil solution. Also, the ground surface under the bridge was scalped to remove all vegetation over a width of 100 ft for the entire length of the bridge.

Work was commenced on this project on December 10, 1955, and in six weeks 169 bents had been completed, including both the internal and external treatments. An average of 50 gal of solution per bent was required.

This work was done under the general direction of B. V. Bodie, chief engineer and H. Boder, bridge and building engineer, and under the direct supervision of S. V. Mills, track supervisor at Tuscaloosa.



CYLINDRICAL OBJECTS are electrical strain-gage load cells installed in conjunction with a beam-and-lever system.

The Electronic Track Scale...

• Its Principle of Operation Explained

• How It Works in Actual Service

By Robert B. Zilius
Streeter-Amet Company
Chicago

● The newest innovation in high-speed motion-weighing track scales is the completely electronic track scale of modern design. Track scales of this type do not sacrifice accuracy for speed. They are designed to operate from electrical strain-gage load cells rather than from the beam-and-lever systems that are utilized in a mechanical weighing operation.

How Weight Is Transmitted

In a typical electronic motion-weighing track-scale installation the scale would be approximately 90 ft long. The weighbridge would normally rest on eight load cells of the required capacity, i.e., 100,000 lb, 200,000 lb, or whatever is applicable to the specific installation. The load cells would be mounted on concrete piers and would carry the weighbridge. Each corner of the weighbridge would be mounted on a load cell and the other load cells would be spaced approximately one-third of the scale length from the corner cells, subdividing the scale into equal distances from load cell to load cell. A cable from each load cell would run into a conduit which would extend to the recording unit.

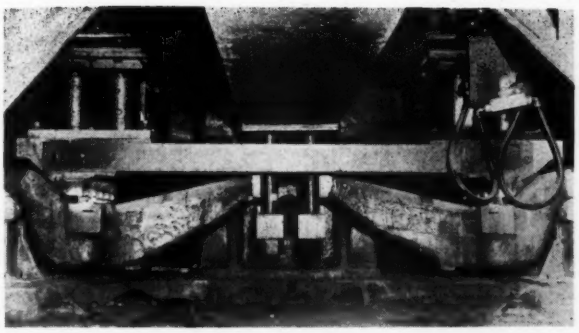
In the weighing operation the load imposed on each of the load cells is converted into an electrical signal which is picked up by the servo system and sent through an amplifier to the recording mechanism. There the amplified signal causes a series of type wheels to be positioned. The weight impression is left on a tape or ticket (whichever type the machine is set up to print) when a print hammer strikes the typewheels through an inked ribbon.

Plug-In Type Units

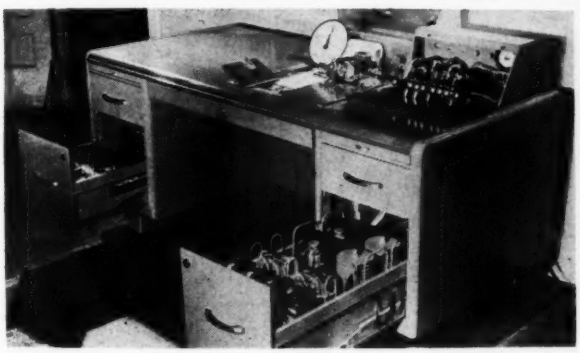
In one type of recorder all the operating components are built into the drawers and top of a desk-type housing. The unit contains all the components except those which are located in the pit assembly, such as the trip solenoid and load cells. Most of the operating units are of the plug-in type and can be readily removed and replaced in a matter of seconds. Spare parts, such as relays, power supplies and step switches, are mounted next to the operating components. All circuits are fused with signal lights to simplify identification of a defective circuit. Systems such as read-out mechanisms, Teletype and other business machines are easily installed to operate from the motion-weighing track scale.

A Dual Installation

The photographs show a track scale at the Kirk yard of the Elgin Joliet & Eastern at Gary, Ind. This scale contains both a lever system and electric strain-gage load cells. It is a test installation in which the mechanical system and electronic system can be operated either separately or in conjunction with one another. A mechanical recorder is operated from the mechanical lever system and an electronic unit from the electrical strain gage cells. In other words, in the mechanical weighing operation, the weight is taken from the main lever and transferred through the lever system to the mechanical recorder. In the electronic unit, the pressure of the weight on the load cells upsets the bridge balance and sends a signal to the electronic recorder. There are two load cells on each corner of the weighbridge and eight at the center, giving a total of 16. The load cells each have a capacity of 100,000 lb and are placed in pairs. Single load cells with a capacity of 200,000 lb could have



IN SCALE PIT at Kirk yard showing load cells mounted above main levers of the mechanical system.



DESK-TYPE housing contains all operating and recording components of electronic scale except those located in pit.

WEIGHMASTER in scale house at Kirk yard has clear view of cars as they move down hump and across the scale.

been used but the paired arrangement of smaller units was selected for mechanical stability.

How a Car Is Weighed

The track section consists of two "dead" rails and two "live" rails. As a car enters the scale on the live rails the flanges of the wheels depress a trip lever which is solenoid operated. The trip lever counts the wheels of the car. As the first wheel contacts the trip and enters the scale, the recorder mechanism starts moving toward the predetermined weight of the car. As the second wheel contacts the trip, the predetermined weight is corrected, bringing the predetermined weight nearer the correct total weight. The third wheel brings the weight in still closer and the last wheel brings the scale to actual weight, dampens oscillation due to vibration and prints the weight after the car is scale borne three seconds. The tape advances automatically to a visible position and the operator can write in other pertinent data such as the car number, identification, etc.

The whole operation is visible to the weighmaster seated at the desk in the office. The weighmaster "zero's in" the scale prior to weighing cars, so that the first printed figure on the tape is 0000.0000. This is done manually by depressing the zero adjust switch and then the print switch. The only print that can be obtained manually is the print to determine zero. All car weights are printed automatically and cannot be printed manually under any circumstances. After weighing a cut of cars the weighmaster again obtains a zero print. He then depresses the tape advance switch and advances the tape far enough to tear off the section with the weights so they can be attached to the files. The weights are printed on a 5-in tape and the weight becomes immediately visible to the weighmaster. Space is allowed between printed weights to allow direct subtraction for net weights.

After a car has been weighed the operator depresses the cycling switch to recycle the scale if the red light is on, the scale recycles automatically, the green light goes on, the operator depresses the count selector switch, all the lights on the control panel turn green, and the trip comes into the up position for contact with the wheels of the next car.

Cars approaching the scale enter at about 4 mph and average 8 to 15 mph leaving, depending on the weight and the length of the car. The approach from the apex and over the scale is at a 3 per cent grade and the grade leaving the scale is 6 per cent. Cars up to 52½ ft in length are weighed at the standard 3-second interval. Cars of exceedingly long lengths, such as gondola cars, are weighed at 2½ seconds since they are not scale borne a full 3 seconds due to their length. The weighmaster controls the 2½-second printing time with a foot-control pedal. When the weighmaster depresses the pedal and prints at 2½ seconds a flashing red signal light glows on the control panel and marks the printed weight, identifying the 2½-second weighing time. The next car is again weighed at the standard 3-second weighing time unless the weighmaster again depresses the pedal.

The total maximum capacity of the scale is 400,000 by 100 lb. Dial readings can be obtained to 25-lb increments for static weight testing. The tape replacement is a simple matter which takes approximately 15 to 20 seconds to complete. In heavy usage (about 1000 weights) the tape may have to be replaced every two days.

CONCRETE MIXER trucks with revolving drums are being used by the Chicago Transit Authority to lay ballast for a new double-track rapid transit line being constructed in the median strip of the Congress Street Expressway. Each truck can carry over 17 tons of crushed stone which is distributed directly on the tracks. The CTA claims its crews can ballast as much as a half mile of double track per week which is three times as much as they did when the ballast was dumped at the edge of the median strip and then transferred to the tracks by other means. The new method is reported to have resulted in savings up to 40 cents per ton of material used.

News Briefs in Pictures . . .

ARMCO steel piling consisting of 60-ft sections, 18 in. in diameter, and with a ¼-in wall thickness, support this 160-ft bridge (above) on the Southern near Golden Gate, Ill.

LEFT—Forty 100-ton railroad hopper cars can be unloaded per hour with this automatically controlled revolving car dumper used to supply coal for a Cleveland electric power plant.

YOU'RE WRONG! This is not a trestle-filling job. The Caterpillar bulldozer is uncovering a temporary trestle driven in a fill on the site of an underpass being built to carry the Indiana Turnpike under the NYC's tracks near Gary, Ind.

WHAT'S THE ANSWER?...

. . . a forum on track, bridge, building and water service problems

Maintaining Grades in Retarder Yards

Track gradients in retarder yards are subject to changes due to settlement and other causes. These have an effect on the speeds of cars being classified after they pass the retarders. What can be done to insure that the gradients of these tracks are maintained within design limits? How often should they be checked? How can this check best be made?

Check Grades Annually

By M. W. Bell

Division Engineer, Atchison, Topeka & Santa Fe, Argentine (Kansas City), Kan.

First in importance in the construction of a retarder yard is the design of the fill and also the selection of the material to be used in it. At Argentine our fill was made with clay soil which was compacted to the best of our ability. However, we found that there has been some settlement. This settlement has not been alarming but has changed the grade of the tracks slightly during the years the retarder yard has been in operation. In order to retain our proper grades we have set sea-level bench marks at various locations, from which checks can be made of the grades of the various tracks in the hump classification yard.

It has been our practice to cooperate with the retarder operators. Where they find that they are having some difficulty with cars rolling into the yard from the retarders improperly, we have checked the grades and corrected them wherever necessary. It has been our practice to make a thorough check of the grades once each year, and last year we surfaced the entire classification yard with a small extra gang, using fine chat from the Joplin area. We found that some of the tracks had slight dips which retarded the cars. If surfacing had been neglected, we would have had damage from coupling impact.

There is another governing factor which should be closely watched. This is particularly true in a yard the size of Argentine where there are 56 tracks in the classification area, which necessitates considerable curvature on many of the tracks at the head end of the yard just below the retarders. These curves should be watched for gage, as it has been found in some cases that tight gage will slow up the operation. We maintain two flange oilers near the crest of the hump, which lubricate the rails in the switching operation. This not only saves considerable wear on the rails, but assists in lubricating the rail so that the cars operate more freely through the curves.

Substantial foundations are very important for the retarders. We have concrete foundations under our retarders, twelve in number, at Argentine. It has been necessary for us to do some grouting work to stop the pumping action of the concrete foundations. As a suggestion, it would be our recommendation that piling be used in future construction of retarder foundations to provide a more substantial foundation for the retarders.

Set Grade Markers in Track

By H. C. Forman

Assistant Chief Engineer, Louisville & Nashville, Louisville, Ky.

Changes in the gradients of classification tracks below the final retarders affect the speed of cars. Excessive variation from the design limits will result either in cars slowing down and not rolling a sufficient distance after leaving the final retarder, or cars accelerating with such speed that damage results from impact on coupling with other cars on the tracks. It is therefore very important that the track gradients be maintained within the design limits.

A great deal can be done by proper design and construction of the yard to insure low maintenance. Good material should be used in the roadbed, and it should be well compacted. It is important that ade-

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Answers to the following questions are solicited from readers. They should be addressed to the What's the Answer editor, Railway Track and Structures, 79 W. Monroe St., Chicago 3, and reach him at least five (5) weeks in advance of the publication date (the first of the month) of the issue in which they are to appear. An honorarium will be given for each published answer on the basis of its substance and length. Answers will appear with or without the name and title of the author, as may be requested. The editor will also welcome any questions which you may wish to have discussed.

To Be Answered In the July Issue

1. How often should track be surfaced out of face? Does the type of ballast affect the frequency of surfacing? Why? Explain.

2. What are the minimum standards of artificial illumination for outdoor diesel-servicing facilities? Indoor? What types of electrical fixtures are best adapted to provide this illumination? Where should they be installed?

3. What factors should determine the choice of the minimum weight of rail to be used in the leads of hump-retarder yards? The body tracks of such yards? Explain.

4. Where the accumulation of silt and other material has reduced the waterway opening under a bridge below that required by the drainage area what are the most effective methods of restoring the opening to the required size? Explain.

5. What is the most economical organization for slot-grinding rail ends out-of-face? With what equipment should such an organization be supplied? How often should this operation be carried out? Explain.

6. When there is no record of the location of underground water mains or other pipe lines, what is the most effective method of establishing their location? Explain.

quate drainage be installed also.

Use of a good sub-ballast blanket of the proper material, evenly spread and well compacted over the yard, will provide a good foundation for the tracks and greatly reduce settlement and changes in gradient after the tracks are surfaced. The tracks should be laid with the heaviest weight rail in use by the road constructing the yard.

After the tracks are surfaced and the design gradients established, permanent reference points should be set to serve as checks and aids in restoring gradients after changes occur. The reference markers should be metal rods or short sections of light rail. The markers should be set at 100-ft intervals on the design gradient, the top of the markers to be flush with base of rail and preferably on center line of track.

Checks should be made at 60-day intervals, or oftener if observation shows that the gradient or rolling characteristics of the tracks are changing.

Checks on the gradients can best be made by use of a level board and rule. It is good practice to have the reference points checked at least once a year by engineers using a wye level and level rod to determine if there has been any movement or settlement in the reference points.

Uses Engineer-Set Elevations

By F. H. McKenney

Engineer of Track, Chicago, Burlington & Quincy, Chicago

The views expressed here are more or less personal and may not be representative of practices on other railroads.

We have three hump yards with retarders, all of which are over 10 years old. The humps and retarders are maintained quite close to design limits by using elevations set by the engineers and occasionally rechecked by them. The gradients of the tracks in the classification yards have not been maintained as carefully as might be desired. One of the reasons is the difficulty of finding time when the tracks can be cleared. It would be desirable to make corrections annually. The check can only be made by the engineers, and necessary stakes or monuments should be set for elevations to be maintained. Due to curvature of the tracks, the proper gradient must usually be worked out independently for each track. Some of our classification tracks have not been accurately checked for several years, but have been maintained by section men smoothing the grade line as it became necessary. The desirable method is to check the grades periodically and correct a group of tracks at a time if the variation from design grade warrants it.

In the older yards where retarders were hand controlled, the operators allowed for variations in the way cars rolled on certain tracks, and we probably did not give their maintenance the attention it deserved. However, with the new automatically controlled retarders, we will no doubt need to be more careful in maintaining the design grade.

It would be desirable to have permanent elevation markers set for each track for the guidance of maintenance men. However, such markers or monuments are often themselves difficult to preserve since they are subject to damage and movement. Fortunately, the eye can usually detect variations from normal and elevations can be rechecked if there is reason to think they have been disturbed.

Draining Hot-Water Heating Systems

Should the hot-water heating systems used in stations and other buildings be drained at the close of the heating season? Why? Explain.

Drain System Annually

By James J. Healy

Assistant Division Engineer, Boston & Maine, Boston, Mass.

Hot-water heating systems in all stations and other buildings should be drained annually at the close of the heating season and particularly in locations where the water supply contains a high concentration of suspended solids, iron oxides and/or other corrosive agents. The work should be performed by maintenance forces rather than by station agents, janitors or caretakers to insure competent handling.

The circulating water should be removed and sampled for corrosive agents. The proper quality and amount of inhibitor required to protect the boiler and piping system during future operation can thus be determined.

Furthermore, additional steps for preventative maintenance should be taken at this time. These consist of inspection of expansion tank, automic feed valves, safety valves, circulating pumps, etc. Minor repairs should also be made where necessary.

On many railroads, insurance companies or local authorities require an annual or biennial boiler certificate, and the maintenance forces can and should check the heater and firing unit to be sure that these units meet the required certification.

Add Minimum of Raw Fresh Water

By J. A. Jorlett

Engineer-Structures, Chesapeake Region, Pennsylvania, Baltimore, Md.

Where used in railroad stations and other railroad buildings, hot-water heating systems will be of the one or two-pipe gravity type in older installations and most likely of the one-pipe or two-pipe forced-circulation type in later installations. In the gravity types, hot water flows by virtue of thermo-syphon action while in the forced system the water is circulated by means of a pump which is usually driven by an electric motor.

Thermo-syphon circulation depends on differences in the density of the water, which vary with its temperature, in the flow and return pipes. In this system either an open expansion tank or a closed expansion tank is used. Raising the temperature of water causes it to expand in volume. In an open expansion tank an overflow pipe is provided to allow water to escape as it expands if the level of water is maintained higher than that necessary to keep the system filled. Where a closed expansion tank is used, only enough water is admitted to occupy part of the tank's volume. This permits formation of an air cushion. A calculated relationship must exist between the volume of water in the entire heating system, the size of the expansion tank, and the volume of the air cushion.

The gravity system operates under a small pressure differential so that all piping must be pitched carefully to allow all air in the system to be vented. When changing the size of horizontal runs of pipe, eccentric fittings should be used to keep the tops of pipes in line and thus permit free passage of air along the pipe. Where pipes are run around obstacles they should be dropped below the obstacle. If they are looped over the obstacle a venting device at the high point of the pipe will have to be installed. All radiators should have venting devices also.

When a system has been in operation for some time, air and gases are released as the water is repeatedly heated and they find their way to the expansion tank or to vents. If the system is maintained with only enough make-up water to balance the losses that occur, through evaporation or slight leakage little air will get into the system.

The questioner may have in mind the deleterious actions which can occur in the interior of the piping or heating facilities by cyclic draining and filling. These deleterious effects may be caused by scale, sludge, corrosive products, or biological deposits. Scale may be formed on the interior surfaces of piping, heat-transfer facilities, or boilers with the water and is promoted by one or more factors:

(1) The concentration of solids may be increased by the evaporation of water.

(2) Dissolved solids may be rendered less soluble by changes in temperature of the water.

(3) Conditions may favor the decomposition of unstable compounds and the formation of less stable compounds.

When heating water is used repeatedly through the system, there will be a reduction in scaling.

Slimes in water depend upon slime-producing organisms obtaining enough food material to propagate their life processes. Only when this material is introduced in a hot-water heating system through addition of fresh water or contaminated air, will trouble from slimes result.

Corrosion is the destruction of a metal by chemical or electrochemical reaction with its environment. The corrosivity of water is increased in proportion to the amount of deleterious substances present, the temperature, and usually the rate of flow of the solution over the metallic surfaces. Dissolved oxygen, acid gases, and chloride salts are the corrosion accelerators frequently responsible. Neutral and slightly alkaline waters saturated with air corrode iron at a rate about triple that of the same water free from air. Hot water containing oxygen will corrode iron at a rate three to four times that of the same water when cold. Corrosion of iron decreases as the pH factor (the concentration of the hydrogen ion) of the water solution increases, and practically ceases at a pH of 11. As a usual thing, corrosion does not create important trouble on the inside surface of iron when water temperatures are maintained below 140 deg F.

It is axiomatic, therefore, that a minimum of raw fresh water be introduced in any hot-water space-heating system, and all oxygen in the trapped air be purged from the systems through vents to secure the maximum life of piping and other facilities in the system.

Paragraph H-92 of the ASME "Low Pressure Heating Boiler Code of 1946," specifies that provisions must be made for draining a closed expansion tank without emptying the system. The expansion tank will collect sludge and it will be desirable, in some localities, to remove this sludge to reduce the suspended material in the water. It is probable that the reduction of deleterious damage to hot-water piping was in mind when this paragraph was put in the Code.

Track Inspection on Branch Lines

On branch lines where traffic is relatively light and sections are long, section forces are sometimes reduced to the foreman alone. Under these circumstances, how should track inspections be carried out?

Provide a Light Motor Car

By G. B. McClellan

General Roadmaster, Texas & Pacific, Fort Worth, Tex.

If there is a supervisor-patrolman, and if union agreements permit, he should carry a maul, a wrench and a few bolts with him, on his inspections, and make such small emergency repairs as he can; otherwise, he might take a laborer with him for this purpose. However, if the foreman has no laborers at all, he should be provided with a light motor car and should work regularly at such maintenance work as he can carry out alone. He should patrol his section weekly if there is no patrolman.

If the track is inspected regularly by a supervisor-patrolman, he should plan the foremen's work and let them devote all of their time to productive work. Even though he alone cannot undertake any heavy program, an able-bodied, determined foreman will nevertheless accomplish results of which both he and his officers will be proud.

Problem Is Transportation

By F. B. Kelly

Supervisor of Safety, Minneapolis, St. Paul & Sault Ste. Marie, Dresser, Wis.

Let us go back to the lean years and see what was done when, as a matter of economy, it was necessary to reduce forces to the foreman alone on some light-traffic lines in the winter months.

At that time a lighter wooden-frame motor car was used. However, the big problem was getting the motor car on and off the track. This was solved in various ways. In some cases, the foreman was strong enough to handle the car himself. In others, he had to get help. The help was either another employee, such as an agent, or some outsider who willingly lent a hand because of a chance to get a few days future work. Lucky were the foremen who worked on sections which headquartered at points with more than one section at the same station. They then were in a position to assist one another either in placing the cars on the track or patrolling.

Some of the crews were fortunate enough to get lighter one-man motor cars which solved their lifting problem. In some places velocipedes were available and were used by the foreman to make his inspection. The foreman was able to carry a few tools on the velocipede, and these were augmented by other tools and supplies stored or planted along the section.

Once the means of transportation was placed on the track, the fore-

man made his track inspection, trying to keep his eyes open to both the safe operation of the car and the detection of any defect which had to be corrected for safe passage of trains. The foreman, using the regular section motor cars, had to arrange to meet the train or trains at some spur or siding. If, for some reason, he could not make the siding to clear a train, it would be necessary for him to flag the train and get the trainmen's help in removing and replacing the car. When the foreman returned to his headquarters at night, he would use any means that were at hand to get the car put away. In most cases, this would be the only time the car was taken off the track after it was put on in the morning.

After heavy snows more problems arose on those portions of the track which could not be run over until a train or a plow had been run. In the meantime, the foreman did what could be done at his station or by walking until the train showed up. He then might stop the train and go along with it over his section, doing what work he could while the train crew was performing station work. If the foreman was lucky, another train would carry him back to his headquarters. If there was no train, he had to make other arrangements for getting back, either by walking or by having someone with a car come and get him.

As can be seen, there was no standard procedure for track patrol and how it was done depended upon conditions, equipment and available assistance. There is no need to say that very little maintenance work was done on account of time consumed in making the inspection.

In some cases today, it may be necessary to reduce forces to the foreman alone on low-revenue branch lines where traffic is light. Where this is necessary, the situation can be helped by furnishing the foreman with light one-man cars which he can handle. The use of the lighter car would solve that part of the problem of putting the motor car on and taking it off the track. However, when snow comes, the problem is much the same as it was in the lean years. This situation can be helped in some cases where a foreman is willing to use his car and the company allows him mileage to pay for his automobile expenses. Roads are usually plowed soon after a snow storm so a car can be used to get to trouble spots and correct them before a train is due.

The use of a track patrolman on a branch of the type we are referring to has not been brought into this discussion. On branch lines such as these, where the forces are cut to the foreman alone, it is more than likely that a track patrolman would not be assigned.

If the branch line could be kept free of snow, the problem of making track inspection during winter months would be simplified. However, snowplows are usually run on such branch lines only when necessary for train operation.

Under these circumstances track patrols are like they were in the lean years and they have to be done the best way possible. This way would depend upon conditions, equipment, and assistance available.

Bulkheads at Ends of Timber Bridges

What is the most effective and economical type of bulkhead construction at the ends of timber bridges and trestles? What factors affect this choice? Why? Explain.

Suggests Several Types

By G. W. Benson

Superintendent of Bridges, Central of Georgia, Macon, Ga.

Bulkheads at ends of timber bridges and trestles can be constructed of timber, concrete, grouted stone or slag and certain conditions will justify construction of concrete or metal crib walls.

Inspection and study should be made to determine the need for this type of construction. The type of construction selected should be that which will fill this need. Consideration must include first cost, maintenance and fire hazard.

A number of small and comparatively light bulkheads have been constructed from the ends of trestle headwalls to edge of roadbed. This is usually done in lieu of restoration of fill section at the headwall. Such work can usually be avoided by dumping one or more cars of screenings around the headwall which will eliminate maintenance problems and possible fire hazards.

Walls built of second-hand timber last a comparatively short time unless the timber is retreated. Handling cost and treatment make this type of construction very expensive.

I think good second-hand timber and a combination of grouted stone and slag and the use of stone and bag rip rap will serve for construction of most of these bulkheads when they are found necessary.

Use Small Concrete Abutment

By G. L. Staley

Bridge Engineer, Missouri-Kansas-Texas, St. Louis, Mo.

The best way to build bulkheads on timber trestles is not build them at all. In most cases a panel or two can be added to the bridge so that no bulkhead is needed. It is, of course, necessary to use enough timber in the bridge so that the roadway fill does not contact the cap at the end bent. In no case, if at all practicable, should the timber bulkhead be more than 28 or 30 ft wide at the bottom. In locations where the bridge cannot be lengthened to avoid this, piles are often driven in front or back of the bulkhead so that it can be maintained with a greater base width.

The best and most effective bulkhead, as well as generally the most economical, is a small concrete abutment which should be a part of railroad standard plans for timber trestles of both the open-deck and ballasted-deck type. Where a suitable sub-foundation exists, not too far below the track grade, the concrete bulkhead is cheaper than any other and will outlast several cycles of timber replacements of the trestle.

Some railroads are using precast concrete planks for bulkheads, and, in varying degrees, precast end bents. These have not been in service long enough to establish either economy or practicability.

The use of concrete bulkheads permits following the usual design methods for concrete abutments so that a stable end support may be had. There is no way to design a timber bulkhead, even with use of second-hand stringers which is a common practice, other than to recall what construction has failed and what has not.

A Neglected Subject

By J. S. Hancock

Bridge Engineer, Detroit, Toledo & Ironton, Dearborn, Mich.

Bulkheads are very important parts of a timber trestle as they are the sole protection for the embankment. To be effective, they must have the size, shape and depth that will prevent undermining or washing out of the embankment, at each end of the structure.

There has not been anything like the amount of study and consideration given to bulkheads that has been given major items of trestle construction. Volumes have been written about piles, caps, ties and stringers, and practically nothing said about bulkheads. Also, conditions are so different on the various railroads that the effective and economical type for one railroad might not prove effective and economical on another.

In the past, many railroads, when rebuilding a trestle, would leave the construction of the bulkheads as the last item, using the better stringers salvaged from the old trestle to construct these bulkheads. This enabled the roads to get considerable additional life out of heavy timber that might otherwise have been scrapped. For low bulkheads not subject to scour, I would consider this procedure still practical. However, as labor costs are now high, I would consider it more economical to use new treated timber for the bulkheads so that their life will approximate the life of the remainder of the trestle.

For low bulkheads not subject to scour, we use 8-in by 16-in treated timber. For high bulkheads, or bulkheads subject to considerable scour, we use interlocking steel sheet piling driven to a safe, stable depth below the anticipated scour line with tie-back anchorages when required.

Our 8-in by 16-in bulkhead timbers for single track are stepped down in 18, 22, 24, 26 and 30-ft lengths. We have to carry the 26 and 30-ft lengths as repairs for our older type trestles which have 8-in by 16-in stringers. We carry the 18, 22 and 24-ft lengths in addition in order to have material readily available for either bulkhead or stringer construction. The 8-in thickness may seem excessive. However, no additional piles have to be driven other than the piles in the standard 6-pile end bent to support even the 30-ft lengths.

For railroads that maintain their own concrete crews, the poured concrete bulkhead could be very practical and economical. However, for those railroads who contract their concrete work, this type would not be economical because the concrete yardage involved is usually small and often the location is not accessible except by rail.

For those railroads having off-track equipment heavy enough to handle sizable precast reinforced-concrete slab units, this type of construction should be practical.

It seems that the most effective and economical type of bulkhead must be determined individually for each railroad, the type adopted depending upon location, field conditions, and the equipment and facilities available for construction.

Inexpensive Precast Bulkhead

By R. E. Peck

Bridge Engineer, Missouri Pacific, St. Louis, Mo.

Bulkheads of the precast concrete type are in general use on the Missouri Pacific and have proven most satisfactory from both functional and economical standpoints. They are made at our central casting yard, utilizing so far as practicable the residual concrete from pile and slab pours, which would otherwise be wasted.

The bulkheads consist of horizontal members 5 in by 8 in, recessed on one side to form a channel section with a web 2½ in thick and flanges 1¾ in thick; and 4-in by 6-in vertical members which are bolted to the horizontal members at about 4½-ft intervals, using 6-in by ¼-in asphalt fillers to equalize the bearing. Horizontal and vertical members are reinforced with 4⅝-in and 2⅜-in bars, respectively.

The initial installation of precast bulkheads was made in 1935 and we now have more than 3,000 bulkheads of this type in service. The current cost of a precast bulkhead in place is about $160.

Reducing Wear in Sander Pipe Lines

To what extent, if any, can the wear in pipe lines serving sanding facilities be reduced by lowering the operating pressure of the air? By reducing the size of the pipe? By both? What are the relative advantages and disadvantages of these methods? Why? Explain.

Avoid Excessive Pressure

By Clyde P. Ross

President, Ross & White Co., Chicago

In general in railroad sand plants, sand is elevated through 2½-in sand piping. Excessive pressure should be reduced all possible from that of the air reservoir, which might be 100 lb at the railway shops. This can be done by supplying a 2½-in air-reducing valve and cutting down the air pressure to the lowest level needed to elevate the sand into the overhead bin.

We have elevated sand with pressure of from 60 lb down to 27 lb. When long lines are required, 300 to 400 ft long, trouble is encountered with 2½-in pipe and we always install a 4-in pipe. Right-angle bends should be avoided. When a turn is needed, cut off the corner with two 45-deg elbows with a short connecting pipe between them. Never use elbows alone on right-angle turns. It is preferable to use "tee's," plugged at the top. This will provide a pocket so that sand will hit sand during the elevating process. An elbow, taking the bend, will wear out in a short time.

Sand may be elevated by bucket elevators to eliminate the use of compressed air, but this is very much more expensive and cannot be put in against competition.

Influenced by Circumstances

By Werner Dietrich

Manager Railroad Engineering, Roberts & Schaefer Co., Chicago

The problem of premature wear of pipes, due to the erosive quality of dry sand propelled by air pressure, is influenced by various circumstances.

Lowering of air pressure would benefit the operation should the material lend itself to low-pressure transport. Flaky, flat-shaped sand particles would satisfy this condition, whereas particles with spherical shapes and small diameters

would fail in proportion as their size is reduced.

One has to realize that the single sand particle acts like the wing of an aeroplane in a stream of air. Consequently, air pressure could be reduced as long as the individual grain of sand can be kept in suspension and unaffected by incidental turbulence and/or eddy currents created by directional changes. Primarily, it is for the latter reason that pipe sections as well as fittings are subject to premature wear at intersections. Even though the application of 45-deg laterals with blank flanges ameliorates this condition, it never can be entirely remedied.

It has been found that railroads, for reasons of economy, install true cross or T-fittings at points of 90-deg intersections which of course is bad practice. Two 45-deg laterals with a short pipe section between, forming a longer directional change section, gives the sand-laden air stream a more gentle deflection.

Reducing pipe diameter with the assumption that a like moving force, related to speed, will be created with lower pressure is again a function dependent on the granular size of sand and its consistency. Under ideal conditions, this might work but is not recommended.

The trend toward larger pipe diameters was more popular years ago. Then, it was assumed that a greater air volume under less pressure, similar to that used for transporting waste material in factories with the application of Cyclone collector systems, might also work for sand. Steel chips, which are transported through large cyclone ducts, are after all proportionally heavier than sand. The larger pipes and the more expensive installation were judged unsightly and impractical.

One can therefore draw the conclusion that unless an ideal set-up can be created by using easily transportable sand, by avoiding too many directional changes and by averting long horizontal runs, the wear problem will be inherent to a greater or lesser degree in any installation.

It should be of interest that it has been proven that sand can be elevated by bleeding it slowly from an open vessel under low pressure. This continuous operation is slower as to per ton-hour capacity, but fast enough for the required charging cycle. The same slow elevating service was accomplished with pressure vessels. In both instances, pressures were reduced to about 35 to 40 psi from the common average of 90 psi, using rather clean washed sand with only a small amount of finer particles and only a trace of dust.

A general rule cannot be found which will indicate whether a particular sand has the necessary qualities for low-pressure elevation. The most practical approach is to experiment with various pre-set pressures (installing a regulator) at individual locations. Even then the setting may not be perfect should the consistency of the sand change in the future.

Several observations, however, hold true under a condition:

(1) The finer the granular sizes, the greater the pressure must be.

(2) Only clean, washed sand, free of loamy substances or other impurities, lends itself to a bleeding operation in an open or a pressure vessel.

(3) With the increase of dusty material, the elevation of sand becomes proportionally more difficult.

Elevating Timing Critical

By W. D. Gibson

Water Supply Engineer, Chicago, Burlington & Quincy, Chicago

It is our contention, substantiated by considerable experience in the design and operation of sanding facilities, that the pressure used in blowing or the size of pipe which is used does not materially effect the wearing of sand lines, particularly lines which are installed without abrupt angles or turns.

Obviously the distance the sand must be blown will in a considerable measure dictate the size of the pipe to be used and the pressure required to move the sand. However, we think that 2½ in or 3 in is the maximum pipe size necessary for efficient service. Where sharp turns or angles are required, our procedure has always been to use Y-shaped lateral fittings. These fittings are so installed that there is always a cushion of sand which will provide protection against traveling sand and prevent its striking and wearing out the metal of the fitting.

We are convinced that most of the wear on pipe lines and fittings results because the person doing the blowing allows the air pressure to remain on the elevating drum for too long a period. We have seen tests wherein a full elevating drum of the ordinary size can be emptied of sand in approximately ten seconds. After this time a small amount of sand will, of course, remain. The combination of the air pressure and this small amount of sand will act the same as a sand blast and will have an erosive effect on any piping or fittings through which the mixture of sand and air passes.

Wear Proportional to Pressure

By N. H. Williams

Bridge & Building Master, Delaware & Hudson, Oneonta, N. Y.

Operation economies are obtained by the application of this formula:

$$\text{Brainhours} + \frac{\text{Imagination} \times \text{Ingenuity}}{\text{Practical Experience}} = \text{Less Brawnhours}$$

A sanding operation is not a facility that you assemble and let work. You must make it work. Successful operation is in direct ratio to the degree of planning that is done. Sand is carried in suspension in the air stream. It is frequently pushed by the compressed air through the pipe. The pressure must be large enough to lift the load of sand yet it must not be so heavy as to provide impact at directional changes in the line.

Sand carrying pipe lines wear, within reasonable limits, in proportion to the air pressure used to energize the line. A reduction in pipe size includes a reduction in wall thickness and calls for a reduction in pressure of the air used to move the sand. Smaller pipe diameters will not reduce overall costs. To do an equivalent amount of work the smaller pipe is in service for longer periods of time than the usual 2½-in pipe in general use. Points of greatest wear occur within 8 in of the leading end of the pipe and at the joints and fittings. This is due to the irregular surface of the pipe at joints, resulting in an abrasive wave action of the sand under pressure. Welded lines are preferred to threaded pipe. Welded lines permit the use of long radius bends which is desirable. Directional changes should be as slight as possible. Rubber-lined pipe has a longer service life than unlined pipe.

Rubber hose, used for emergency repairs to sand transmission lines, generally gives longer service than extra-heavy pipe. High labor costs and labor's degree of productivity justify the use of rubber-lined pipe and rubber hose. Replacement of pipe with rubber hose will eliminate a number of joints and radical directional changes in the line.

It is through planning that a reduction in emergencies is effected.

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TIME WAS when we closed up shop early in September when the growing season drew to a close. Our farewell message to a large majority of employees was—"*good work, come back next May.*"

NOT SO TO-DAY—as a matter of fact we never close up shop from one years end to the next one, except when the whistle blows at each days end or when the week end arrives. Twelve months in the year all key men are retained on full time basis, and a sizable plant and mechanical staff are also retained on full time.

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Then, with arrival of early spring, every man is ready for action, plants and spray cars are in prime condition, ready to go on short notice.

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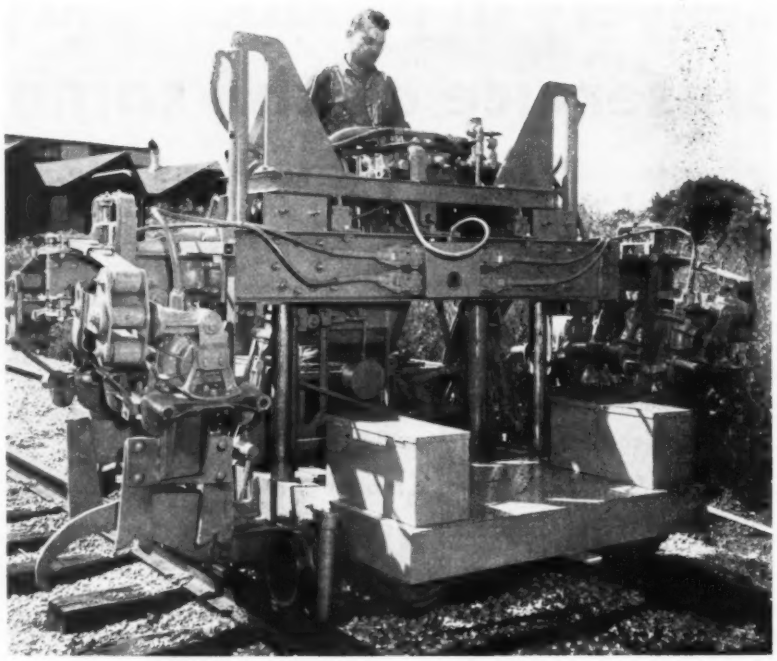


COMBINATION TRACK MACHINE

A COMBINATION hydraulic power jack, hydraulic tie nipper, electric tie tamper, and track leveling device, all in a self-propelled one-man-operated machine, has been announced by the Kalamazoo Manufacturing Company, Kalamazoo, Mich.

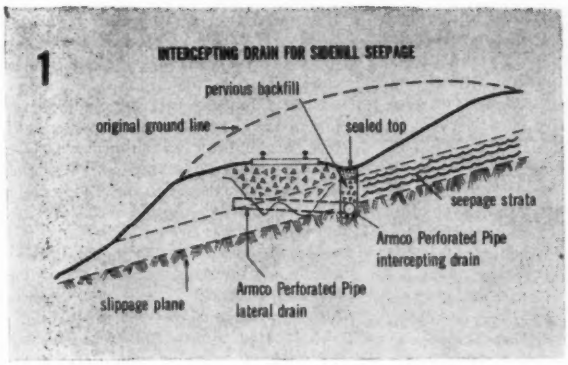
The unit, known as the Handyman, is powered by a Ford Model 172, four-cylinder, 60-hp gasoline engine with the final drive by a Vicker hydraulic motor through geared transmission, allowing speeds up to 25 mph in either direction. It weighs aproximately 8,000 lb and is removed from the track by a hydraulic jack and transverse set-off wheels.

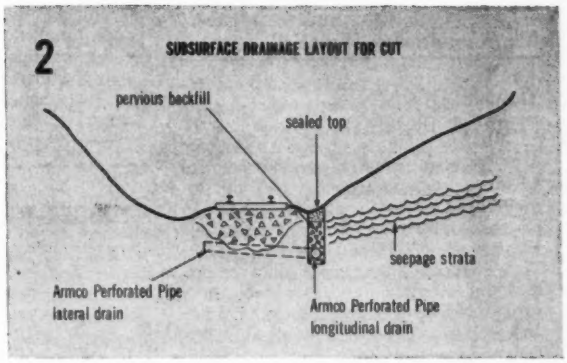
The power jack portion is activated by two 12,000-lb hydraulic rams and the hydraulic tie nippers work on each end of the tie. The tamping head, raised and lowered hydraulically, consists of four Jackson vibrating tamping assemblies, each with two tamping bars. The track leveling device is said to operate for quick and rapid readings which are accurate to $\frac{1}{32}$ in.

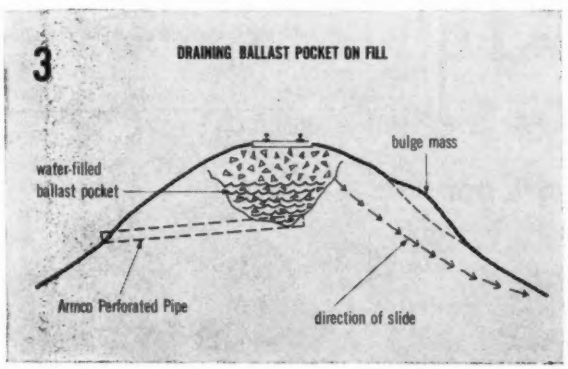
ASPHALT SHINGLES

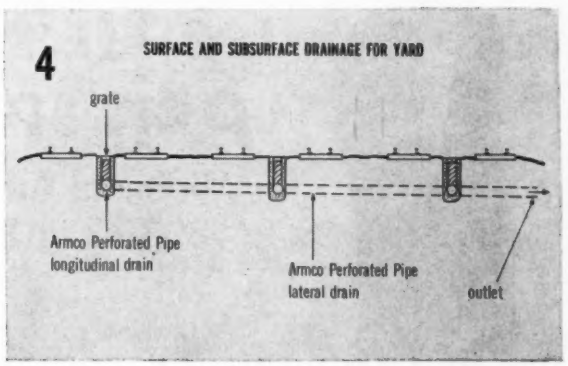
SEAL-O-MATIC is a name that has been applied to a new asphalt shingle that seals itself down automatically. A product of Johns-Manville, New York, the shingle is available in the 12-in by 36-in strip type with three square-cut butts. They come in a range of blends and solid colors. The Seal-O-Matic feature consists of a ribbon of petroleum-resin adhesive, about ⅜ in wide, which is factory applied to the back of the shingle about ¼ in up from the edge of the butt. The adhesive is hard and brittle under normal temperatures. However, after application, the adhesive softens under exposure to the sun's heat and merges with the shingle below. In this way, it is said, the exposed shingle butts are welded to the underlying shingles. It is reported that the holding power thus developed provides strong resistance to "blow-off" by wind or "blow-up" by water.

(*More Products on page 70*)







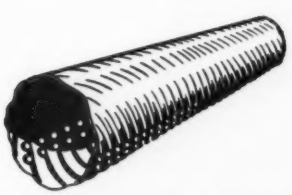


HERE ARE 4 WAYS to eliminate excess water

Armco Perforated Pipe* is the efficient, economical way to remove harmful ground water and stabilize roadbeds once and for all. Slow orders and recurring maintenance are a thing of the past.

The accompanying four drawings show how Armco Perforated Pipe solves subdrainage problems under various typical railroad conditions. It is ideal to cure trouble spots on established roadbeds or for new construction. Installation is easy and fast with your own crews.

Armco engineers will be glad to work with you on your specific problems. Write us today for data and recommendations. Armco Drainage & Metal Products, Inc., 4675 Curtis Street, Middletown, Ohio. Subsidiary of Armco Steel Corporation. In Canada: write Guelph, Ontario. Export: The Armco International Corporation.



* Armco Perforated Pipe is made of corrugated metal and supplied in diameters from 6 to 48 inches. Lengths up to 20 feet. Quickly attached coupling bands join individual lengths into a strong, integral conduit. No danger of disjointing or breaking.

ARMCO PERFORATED PIPE

ARMCO®

Products of Manufacturers (Cont'd)

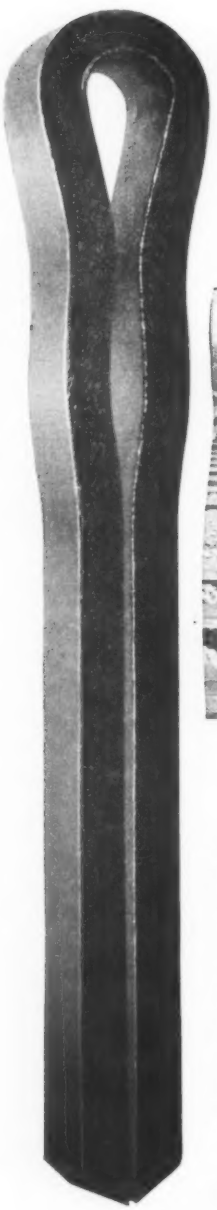
TRANSLUCENT PLASTIC PANELING

A NEW material that provides colorful translucent plastic paneling for both interior and exterior construction has been introduced by the Barrett Division, Allied Chemical & Dye Corp., New York. This material, known as "Allite" translucent plastic paneling, is available in a variety of colors, weights, sizes, finishes and degrees of light transmission. The material is reported to be shatterproof, weather and fire resistant, lightweight and durable. The panels are available either corrugated or flat. The material is applicable for sidelighting, skylighting, weather shelters and ticket-window separators.

RUBBER-TIRED DOZER

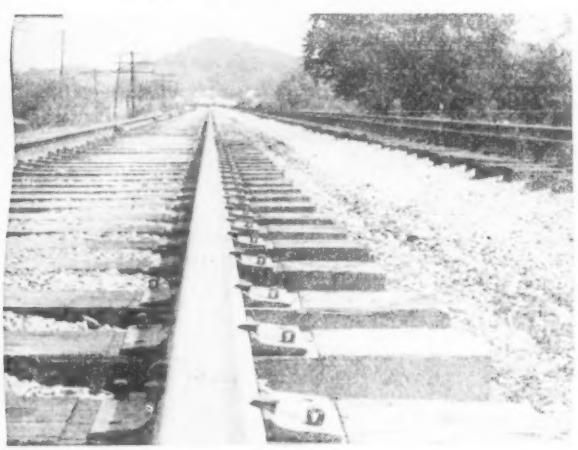
POWERED with a turbocharged diesel engine, a rubber-tired dozer has been introduced by the Construction Machinery Division, Clark Equipment Company, Benton Harbor, Mich. Known as the Michigan Model 180 Turbo-Dozer, the unit has a 165-hp rating and a capacity of 2¾ cu yd. It has a four-wheel drive, rear-wheel steering and an over-the-road speed of 27 mph. Among the reported features of the machine are a power-shift transmission, a heavy-duty torque converter which provides 3 to 1 torque multiplication and planetary wheel-drive axles. The bowl is raised and lowered by two double-acting hydraulic cylinders and is tipped back and forth by a 6-in double-acting cylinder. Both ends of the blade are fitted with vertical cutting edges. Two 1½-in holes have been provided for pusher-block mounting.

A locking differential in the front axle automatically applies power to the wheel with the firmest footing when one wheel begins to slip. The machine is equipped with a 24-volt starting system; 18.00 x 25, 12-ply high-flotation tires; vacuum-power-boosted four-wheel brakes; two-wheel mechanical brakes; and a 50-gal fuel tank.



USE TIE PLATE LOCK SPIKES

for Minimum Annual Cost of Ties in Track



• hold gage • prolong life of ties
• save maintenance expense

LOCK SPIKES hold tie plates firmly in place on cross-ties and bridge timbers. They are quickly and easily driven, or removed, with standard track tools. Driven to refusal, the spread shank is compressed by the walls of the hole. Tie plates are held against horizontal and vertical movement under spring pressure. Play between the spike and the hole is eliminated—gage is held and plate cutting is overcome.

LOCK SPIKES not only become integral with the tie plate, but also the lateral pressure by the legs against the sides of the tie hole, binds the spike in the tie. This unique feature gives tight adhesion between tie and plate.

LOCK SPIKES were first installed in 1947. Since they have been in track, no maintenance whatever has been required. Cost of installing in track is low and comparable to cut spikes. The advantages and saving only found in Lock Spikes reduces the annual cost of ties in track and maintenance expense to a minimum. We invite your investigation.

BERNUTH, LEMBCKE CO., INC.
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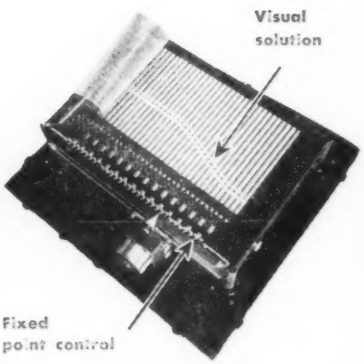


IMPROVED CURVELINER

THE NEW 1956 model, Type A-15, of the ARC Curveliner incorporates a number of improvements according to the manufacturer, the American Railroad Curvelining Corp., Douglaston, N. Y. The redesigned sliding gear box is said to be smoother in operation because of a special bell cam and ball-bearing rollers which have been incorporated in the positioner. It is said that no lubrication of the box is now required and that it cannot stick or jam. An easy hand grip replaces the knurled control positioner on the main actuator of the sliding gear box. Visibility of the rotary throw indicators is reported to have been improved by using white figures on a black background. The recording-paper holder is reported to be much easier to use than on previous models. The carrying case has been redesigned to incorporate shock-absorbing mountings for the Curveliner and includes new special carrying brackets.

The company's Throwmeters are also said to be improved by incorporating stainless steel springs to give longer spring life and greater durability. The Throwmeter base is said to have an improved anti-corrosion gold-colored coating which insures all-weather service.

THE MONTH'S NEWS...

. . . among railway men—the associations—the suppliers

General

R. L. Lamb, special engineer—operations on the Chesapeake & Ohio at Richmond, Va., has been appointed assistant to trainmaster with headquarters at Huntington, W. Va.

M. C. Jennette, chief engineer of the Norfolk Southern, has been appointed assistant vice president with immediate jurisdiction over engineering, construction and maintenance of way and structures, with headquarters at Norfolk, Va.

G. B. Aydelott, executive vice-president of the Denver & Rio Grande Western, and an engineer through experience, has been named president of the road succeeding the late **Wilson McCarthy.**

Engineering

N. M. Balch, roadmaster, Kalispell division, on the Great Northern at Whitefish, Mont., has been promoted to assistant engineer maintenance of way with headquarters at St. Paul, Minn. **Bruce G. Anderson,** office engineer at Seattle, Wash., has been appointed principal assistant engineer, with headquarters also at St. Paul.

J. L. Loida, chief engineer of the Illinois Terminal at St. Louis, Mo., will assume the duties of **John Leisenring,** electrical superintendent, who has retired.

F. H. Simpson, chief engineer of the New York Central at Chicago, has been appointed chief engineer of the road with headquarters at New York. The position of chief engineer at Chicago has been abolished, and **C. E. Defendorf,** engineer of buildings at Chicago, has been promoted to assistant chief engineer at that point.

Donald G. West, track supervisor on the Detroit, Toledo & Ironton at Lima, Ohio, has been promoted to industrial placement engineer with headquarters at Dearborn, **Mich.**

J. W. Bolstad, assistant district engineer on the Northern Pacific at St. Paul, Minn., has been appointed assistant engineer of track at that point replacing **E. R. Anderson,** whose appointment as division roadmaster at Tacoma, Wash., is announced elsewhere in these columns. **R. E. Nichols,** division engineer at Fargo, N. D., succeeds Mr. Bolstad. Mr. Nichols is succeeded by **R. W. Ripley,** assistant engineer at St. Paul. **R. E. Bredberg,** inspector in the division engineer's office at St. Paul, replaces Mr. Ripley.

Fred C. Rottmann, chief draftsman on the Pennsylvania at Indianapolis, Ind., has been promoted to assistant engineer with headquarters as before at Indianapolis.

Ira Dawson Hefner, Jr., has been appointed assistant engineer on the Central of Georgia, with headquarters at Savannah, Ga.

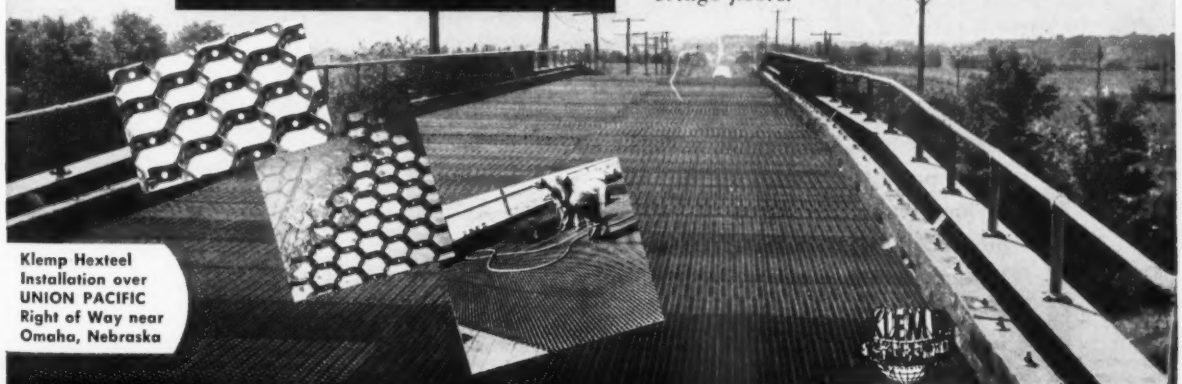
M. J. Hubbard, general supervisor bridges and building of the Southern Region of the Chesapeake & Ohio, has been appointed assistant chief engineer of that region, with headquarters as before at Richmond, Va.

M. E. Lau, whose promotion to district maintenance engineer on the Rock Island at Des Moines, Iowa, was announced recently (*RT&S*, Feb. p. 80), was born on

ELIMINATE costly road surface MAINTENANCE!
INCREASE the LIFE of Bridge Floors over Railroad Passings!

KLEMP HEXTEEL
STEEL FLOOR ARMOR for
Resurfacing Wood Decking

HEXTEEL heavy duty steel floor armor creates a steel surfaced floor capable of withstanding maximum moving loads. Easily installed with mastic composition or asphalt fill for resurfacing wood decking. Prolongs the life of bridge floors.



Klemp Hexteel Installation over UNION PACIFIC Right of Way near Omaha, Nebraska

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Send us data on your bridge floor and load conditions today! We will reply with estimate for your job.

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KLEMP METAL GRATING CORPORATION
6601 South Melvina Avenue, Chicago 38, Ill.

Gentlemen:
Kindly send me a copy of your "Data and Specification Manual."

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Firm_____
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City_____ Zone____ State_____
Phone_____

Railway Personnel (Cont'd)

May 17, 1908, at Klemme, Iowa. After graduating from high school, he entered railway service with the Rock Island on April 1, 1927, as a section laborer and was advanced to foreman in May 1929. Mr. Lau was promoted to track supervisor on June 15, 1939, at Atlantic, Iowa, and was advanced to roadmaster at Peoria, Ill., in April 1945. He was later transferred to Atlantic, and was made acting maintenance engineer at Des Moines in May 1952. He was promoted to general roadmaster at Kansas City, Kan., later that same year which position he held until his recent promotion.

Wolters Ledyard, who has been promoted to division engineer on the New York Central at Columbus, Ohio *(RT&S,* Feb. p. 78), was born on May 8, 1913, at Brooklyn, N. Y., and was graduated from Syracuse University in 1938 with a BS degree in engineering. He entered the service of the New York Central in October 1940 as a chainman in the office of the chief engineer at New York. He was advanced to assistant supervisor of track at Rochester, N. Y., in September 1944 and subsequently held positions as bridge and building inspector, assistant engineer, supervisor of track and assistant division engineer at various points on the road. He was made acting trainmaster at Chicago and Hammond, Ind., on October 1, 1955, which position he held at the time of his recent promotion.

C. T. Popma, whose appointment as district engineer of the Northern district of the New York Central at Detroit, Mich., was announced recently *(RT&S,* Feb. p. 77), was born on August 26, 1920, at Jackson, Mich. Mr. Popma obtained his engineering education at the

C. T. Popma

University of Michigan, graduated in 1947 with a BS degree in civil engineering. He began his railway service with the New York Central in 1937 as a laborer in the maintenance-of-way department at Jackson and later held positions as rodman, draftsman and transitman in the engineering department. On September 1, 1943, he entered military service and served in the European theater as an officer in the field artillery. After his discharge from the army, he obtained his engineering degree and returned to the New York Central as an instrumentman on August 16, 1947. He was promoted to assistant supervisor of bridges and building in January 1948 and subsequently held positions as assistant supervisor of track, supervisor of track and assistant division engineer. On November 1, 1955, he was advanced to industrial engineer at New York which position he held at the time of his recent appointment.

Edward Penrose, whose appointment as engineer of structures on the Delaware & Hudson at Albany, N. Y., was announced recently *(RT&S,* Feb. p. 79), was born on November 9, 1886, at Utica, N. Y. He obtained his engineering education at Union College, Schenectady, N. Y., graduating in 1908 and began his railway service with the Delaware & Hudson on November 12, 1909, as a rodman at Albany. He was advanced to assistant engineer on February 1, 1913, and was promoted to bridge engineer in March 1936, which position he held at the time of his recent promotion.

R. K. Pattison, who has been promoted to division engineer on the New York Central at Mattoon, Ill. *(RT&S,* Feb. p. 79), was born on January 3, 1922, at Ashtabula, Ohio. Mr. Pattison obtained his engineering education at the University of Illinois, graduating with a BS degree in civil engineering in 1947. He

Play your cards straight and make an investment in wood, properly creosoted by REPUBLIC. The record of long service-life (up to 70 years in some cases) proves the benefit of using pressure-creosoted wood. Republic Creosoted Products resist decay in all climates (in acid or alkaline soils) and attack by insects and fungi. This makes REPUBLIC CREOSOTED WOOD a must to economy-minded buyers.

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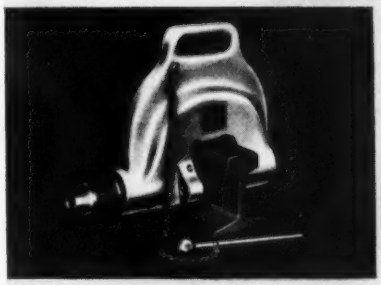
MAKE THIS "SWITCH" AT SWITCH POINTS

to get DOUBLE PROTECTION from TROUBLE



VELOCITY POWER RAIL PUNCH

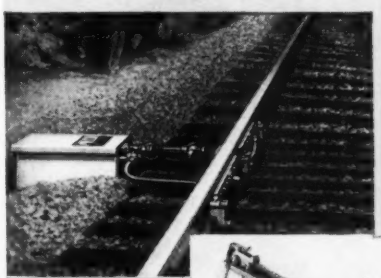
Takes only an instant to punch clean, smooth hole for track bolts. Needs no electricity, compressed air, hydraulic power; operates from small blank cartridge; no open flash or recoil. Only one major moving part, the piston.

MACK SWITCH POINT PROTECTORS

Perhaps you have never realized that the point of the switch rail (which is the weakest part of the switch) receives the maximum impact and wear in deflecting wheels at switches! More and more railroads are double-guarding this trouble spot by installing Mack Switch Point Protectors, which make switch points serve up to 10 times longer than when unprotected—4 to 5 times longer on the original application . . . and then for another equal period when the protectors are removed, reversed and reapplied.

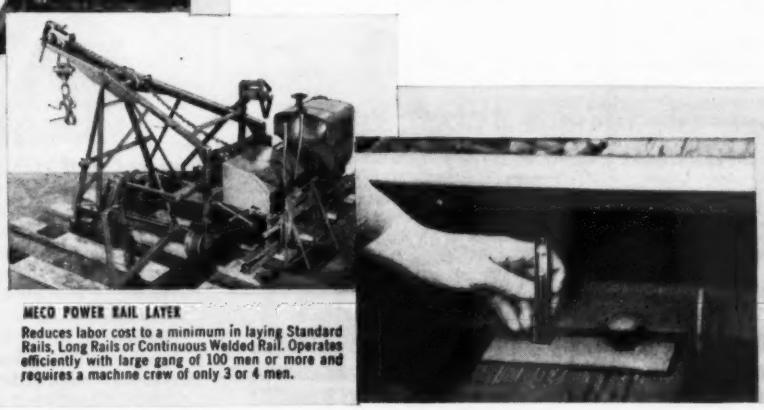
Maintenance Equipment Company

RAILWAY EXCHANGE BUILDING • CHICAGO 4, ILLINOIS



MECO RAIL AND FLANGE LUBRICATOR

Doubles to quadruples curve rail and locomotive wheel flange life by reducing friction between rails and wheel flanges on curves. Also makes possible higher speeds with greater safety.



MECO POWER RAIL LAYER

Reduces labor cost to a minimum in laying Standard Rails, Long Rails or Continuous Welded Rail. Operates efficiently with large gang of 100 men or more and requires a machine crew of only 3 or 4 men.

TYLIFE

Improves track structure . . . Increases tie life. Provides greater holding power in cross ties and bridge timbers; reconditions old spike-worn holes; reduces labor of regauging and re-spiking.

R 1315

Railway Personnel (Cont'd)

entered railway service in June 1947 as an inspector on the New York Central, being promoted to assistant supervisor bridges and building in January 1948. He later served as assistant supervisor of track and was advanced to assistant division engineer in April 1952, which position he held at the time of his recent promotion.

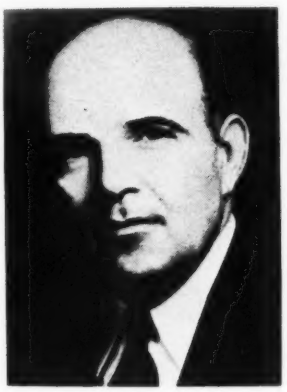
I. N. Wigle, whose appointment as assistant division engineer on the New York Central at Columbus, Ohio, was announced recently (*RT&S*, **Feb. p. 78),** was born on January 24, 1922, at Hamilton, Ont. He attended Queens University at Kingston, Ont., graduating in 1943 with a BS degree in civil engineering. He entered railway service with the New York Central on May 17, 1943, as a draftsman at St. Thomas, Ont., and subsequently held positions as instrumentman, office engineer, assistant track supervisor, and bridge inspector. He was made acting B&B supervisor in May 1955. In September 1955 he returned to his position as bridge inspector until his recent promotion.

As announced in the March issue of *RT&S* (p. 90), **J. Floyd Beaver,** chief engineer maintenance of way on the Southern at Charlotte, N. C., has been appointed assistant chief engineer at Washington, D. C., succeeding **Edgar Bennett,** who has retired. **John A. Rust,** superintendent at Greenville, S. C., replaces Mr. Beaver.

Mr. Bennett, a native of Irvington, Ky., began his railroad service with the Southern as a rodman and transitman in 1909, shortly after being graduated from Kentucky State University. He subsequently served as assistant engineer, resident engineer and roadmaster. He was appointed engineer maintenance of way and structures at Macon, Ga. in 1927; assistant chief engineer maintenance of way and structures at Knoxville, Tenn., in August 1934; chief engineer maintenance of way and structures in January 1944; and was transferred to Charlotte in December 1947. He was promoted to assistant chief engineer at Washington in July 1950, which position he held until his recent retirement.

Edgar Bennett

Mr. Beaver was born at Spencer, N. C., on October 2, 1903. After graduating from North Carolina State College, he entered the service of the Southern on June 17, 1926, as a student apprentice. He subsequently served as assistant track supervisor, track supervisor, roadmaster and trainmaster. In 1946 he was promoted to superintendent at Richmond, Va., and was transferred to Alexandria, Va., in 1947. He was promoted to chief engineer maintenance of way and structures on July 1, 1950, which position he held until his recent promotion.



J. Floyd Beaver

Mr. Rust, a native of Virginia, was born June 27, 1908, and graduated from the Virginia Military Institute. He began his railway service with the Southern as a student apprentice in June 1930 and subsequently served as assistant track supervisor, track supervisor, assistant roadmaster, and roadmaster. He was promoted to division engineer in April 1944 and was appointed trainmaster in July 1950. In July 1953, he was promoted to superintendent at Charleston, S. C., and transferred to Columbia, S. C., in September 1954 and to Greenville in 1955. He was holding this latter position at the time of his recent promotion.

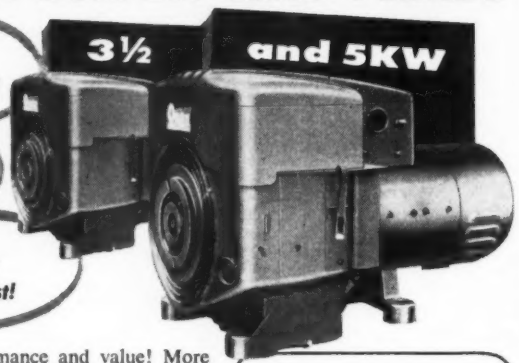
John A. Rust

New ONAN CCK Electric Plants

MORE OUTPUT *per pound of weight!*

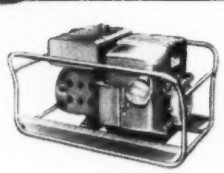
MORE OUTPUT *per gallon of fuel!*

MORE OUTPUT *per dollar cost!*



Way ahead in performance and value! More powerful, two-cylinder, air cooled Onan gasoline engines of 4-cycle, horizontally-opposed design give smooth, quieter, effortless performance. Short stroke and moderate speed cut engine wear, give longer life. Quality features include rotating Stellite-faced exhaust valves, solid Stellite valve seat inserts, full pressure lubrication. Onan's exclusive Vacu-Flo cooling system available for difficult or "buried" installations.

Completely Onan-built, with Onan gasoline engines direct-connected to Onan all-climate generators in compact, rugged units. Available in stationary, portable and standby models with a wide range of accessories.



PORTABLE MODELS
Available with carrying frames or 2-wheel dollies. Easily portable. Other Onan portable models: 500 to 10,000 watts.

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Onan ELECTRIC PLANTS

D. W. ONAN & SONS INC.

3734 University Avenue Southeast, Minneapolis 14, Minnesota

J. W. Davidson, who has been promoted to assistant bridge engineer on the Chicago, Burlington & Quincy, at Chicago (*RT&S,* Jan. p. 58), was born on October 22, 1923, in Chicago and was graduated from the Illinois Institute of

J. W. Davidson

Technology in 1945 with a BS degree in civil engineering. He entered the service of the Chicago, Burlington & Quincy in April 1945 as a draftsman in the bridge engineer's office at Chicago. He was advanced to bridge designer at that point on January 1, 1955, which position he held until his recent promotion to assistant bridge engineer.

Lyle Bristow, who has been appointed district engineer of the Western District of the New York Central, with headquarters at Cleveland, Ohio (*Rt&S,* Feb. p. 77), was born on January 28, 1902, at Indianapolis, Ind. Mr. Bristow graduated from Purdue University in 1926 with a BS degree in civil engineering and entered railway service in June of that year as an assistant engineer on the Big Four at Galion, Ohio. He was furloughed in 1931 and returned to the road as assistant engineer in 1937, and was advanced to track supervisor in July 1940. After serving with the Armed Forces in World War II, he returned to the road as track supervisor and subsequently held the positions of special engineer, office engineer, assistant division engineer and division engineer until March 1955 when he was promoted to assistant engineer maintenance of way, which position he held until his recent appointment.

R. J. Hardenbergh, who has been appointed assistant division engineer of the Pennsylvania division of the New York Central, with headquarters at Jersey Shore, Pa. (*RT&S,* Feb. p. 79), was born on September 24, 1919, at Detroit, Mich. He studied at Wayne University and the University of Michigan, graduating from the latter in 1948 with a BS degree in civil engineering. He entered railway service with the New York Central on June 14, 1948, as an inspector and draftsman in the structures department. From 1950 to 1952, he served as junior engineer and assistant engineer. He was advanced to assistant supervisor of track at Battle Creek, Mich., in 1952. In 1955 he

There's a SIMPLEX JACK to Do Every RAILROAD JOB Faster-Easier

Fast Acting TRACK JACKS

15 ton capacity. The jacks set much more firmly and stand straighter under tie (without damage) or rail, due to large area toe lifts. Trip from either side. Two models have light weight aluminum housings.

ALSO: Tie removers and replacers.

Standard Speed BRIDGE JACK

The new A2515 25-ton jack has an aluminum alloy housing, which weighs only 40 pounds. 9-in. lift eliminates re-setting in bridge work. Recommended for use with jack support.

ALSO: A complete line of hydraulic jacks and pullers.

Ratchet Lowering LEVER JACKS

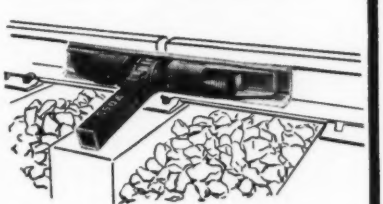
Ideal for lining, shimming, painting, replacing timber decks, pulling headed bolts (½" to ⅞") etc. Available with 3¾" or 5" wide base for use between ties on trestles. Equipped with a 5' chain fitted with a grab hook on one end and a bolt puller on the other.

ALSO: Push and pull jacks for piling.

Time-Saving TIE SPACER

Straightens, Spaces Ties. Pumps Rails. Easily applied and removed. Slides along top of rails.

RAIL EXPANDERS for the Maintenance and Signal Departments



Permits *one* man to replace a rail pounding crew! For lining crossings and switches, pushing or pulling continuous rail, controlling expansion or contraction with no interruption of service. With lever socket locked down, nothing protrudes above rail head.

Pole Pulling and Straightening Jacks for the Signal Department

Two sizes, 5 and 15 tons for pulling or straightening all sizes of poles. Pivots on base, when desired, to any angle. Can also be used for guy wire tightening or for pulling underground cable. Model A1538—15-ton capacity—available with aluminum housing which reduces weight 35 pounds.

ALSO: Cable Reel Jacks for drums 30- to 96-in. diameter.

WORLD'S LARGEST MANUFACTURERS OF INDUSTRIAL MECHANICAL AND HYDRAULIC JACKS

SIMPLEX JACKS

RE-MO-TROL UTIL-A-TOOL JENNY ROL-TOE

Write for Details in Bulletin RR 55

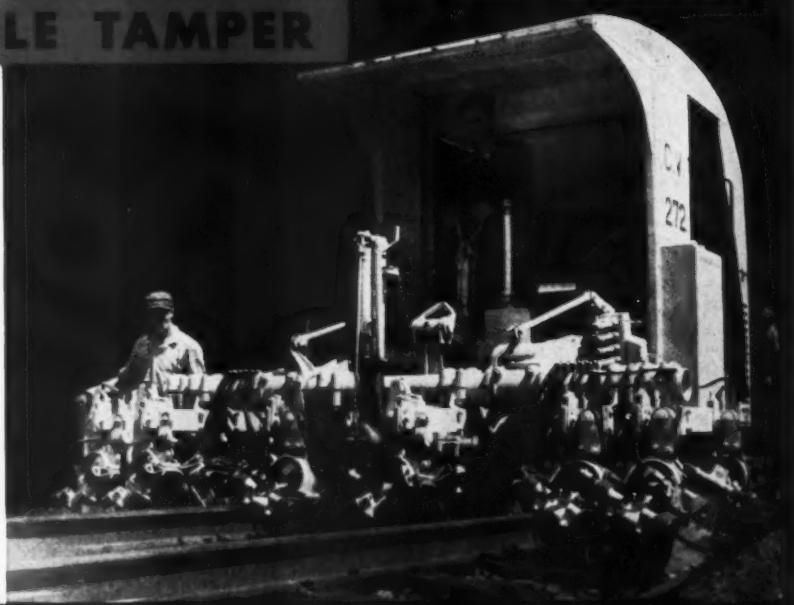
TEMPLETON, KENLY & CO. • 2543 Gardner Road, Broadview, Illinois

JACKSON — Best for EVERY Phase .... of Tie Tamping!

JACKSON TRACK MAINTAINER

For BOTH — *putting* up and *maintaining* finest quality track UNDER ALL CONDITIONS — this is demonstrably the finest machine ever devised. Let us prove it to you.

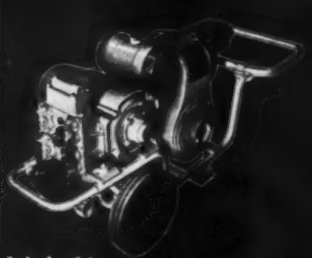
JACKSON MULTIPLE TAMPER



Unsurpassed for putting up track of finest uniform quality in all new ballast insertion jobs and regular maintenance. out-of-face lifts of track. Initial cost is far less than any other on-track tamper.

JACKSON MANUALLY GUIDED TAMPERS

Ideal for low lift and smoothing work with small gangs using 2 and 4 tampers with a Jackson Power Plant. Perfect for tamping the portions of crossings and cross-overs that the on-track tampers do not reach. Excellent for major ballasting operations since any number of these outfits can be grouped for the purpose. Fitted with adjustable handles for maximum convenience of all operators. Available with quickly interchangeable tamping blades which give them unmatched adaptability and efficiency on every type of tamping job.



Power Plant generates both single and 3-phase 115 V., 60 Cy., AC, is exceedingly reliable and, in addition to serving 1 to 4 tampers, may be used for emergency signaling, lighting and operating other power tools.

Tamper has 8" adjustment range to suit convenience of all operators.

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JACKSON VIBRATORS INC. • ELECTRIC TAMPER & EQUIPMENT CO., Ludington, Mich.

Railway Personnel (Cont'd)

became assistant engineer, Detroit division, Northern district, which position he held until his recent promotion.

D. W. Blair, whose promotion to chief engineer, Atlantic Region, of the Canadian National at Moncton, N. B., was announced recently (*RT&S*, March p. 86), was born on April 24, 1917, at Quebec, Que., and graduated from the

D. W. Blair

University of New Brunswick in 1946 with a BS degree in civil engineering. Mr. Blair entered railway service with the Canadian National in 1946 as junior assistant engineer, department of research and development, at Montreal, Que., and was advanced to assistant engineer in 1948 at Levis, Que. Later that same year he was promoted to division engineer at Quebec and in 1950 was transferred to Montreal. In 1953 he was promoted to district engineer, Southern Ontario district, at Toronto, Ont., and was advanced to engineer maintenance of way, Central Region, at Toronto in 1955. A short time later, he was made assistant chief engineer, Atlantic Region, at Moncton.

F. B. Wilcox, who has retired as division engineer on the New York Central at Buffalo, N. Y. (*RT&S*, Feb. p. 78), was born on September 2, 1892, at Parishville, N. Y. He graduated from Clarkson College in June 1916 with a BS degree in civil engineering and entered railroad service with the New York Central on January 8, 1917, in the engineering department. After serving with the armed forces during World War I, he returned to the road and in September 1925 was advanced to assistant supervisor of track. He subsequently held positions as supervisor of track, assistant division engineer and division engineer.

G. A. Carroll, who retired as division engineer on the Rock Island at El Reno, Okla. (*RT&S*, Feb. p. 80), was born on January 31, 1890, at Appleton, Wis. After graduating in 1912 from the University of Wisconsin with an engineering degree, Mr. Carroll entered the service of the Rock Island as a rodman and instrumentman at Eldorado, Ark., and was transferred in 1916 to Dalhart, Tex. He was promoted to division engineer at

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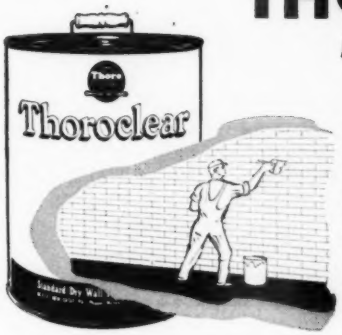

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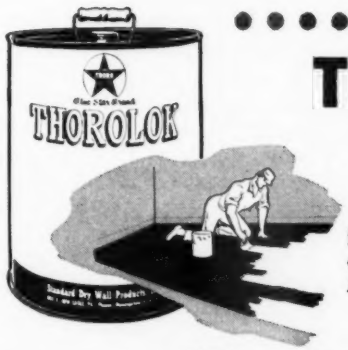
Repair those broken sills, steps, concrete floors, chimneys and other defective masonry! *Ask for circular No. 20.*



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Tournapulls load themselves in wet clay material. Time studies show they loaded an estimated 5.95 cubic yards in about 1 minute. When push-loaded with a 70 hp tractor, load time was reduced to 35 seconds.

2 Tournapulls deliver 96 cu. yds. hourly

speed railroad construction in Sicily

To improve transportation between the seaport city of Gela and the inland trading center of Caltagirone, the Government of Italy is building a 20-mile railroad which will incorporate the most modern developments. The roadway will be wide and straight, automatic signals will be installed, and the right-of-way well-ballasted. All earthmoving for the important project is being handled by Ditta Fratelli Mario e Giorgio Franchetti of Rome. Their 2 D Tournapull-Scrapers helped move 740,000 cubic yards of earth to level hills, fill valleys, and build bridge approaches. Each of these high-speed, rubber-tired units loads, hauls and spreads 48 cubic yards of sandy clay per hour over hauls which average 3300 feet one-way. They have worked steadily for a year, despite rains from November to March which made the clay very sticky, and hot dry weather from April to October which made it extremely hard.

Performance earns repeat order

"We are so pleased with these first 2 units," says Technical Manager Giorgio Franchetti, "that we have decided to confirm our order for a third D Tournapull-Scraper".

"D Tournapulls have performed very well and have given me the greatest satisfaction," says Foreman Eugenio Petronari. "These machines are producing economically the many cubic yards which I demand daily from our operators and earthmoving equipment."

Operator Maganuco Salvatore agrees. "I have been operating many different types of equipment," he says, "but this is the first machine that has produced as many cubic yards per day as the foreman has requested. The Tournapull is easy to operate and maintain. It does not tire me out. It keeps me interested in the job."

Owners around the world are pleased with the dependability and high output of Tournapulls. If you have earth to move to make way for progress, write us for detailed information about these high-speed, electric-control, 7½-yard machines.

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LeTourneau-WESTINGHOUSE Company
Railroad Sales Division
Peoria, Illinois
A Subsidiary of Westinghouse Air Brake Company

Railway Personnel (Cont'd)

that point in 1917. After serving with the armed forces as a lieutenant during World War I, he returned to the Rock Island as division engineer at Kansas City, Mo. He subsequently served in this capacity at Dalhart and at Liberal, Kan., until 1952 when he was moved to El Reno.

Track

E. R. Anderson, assistant engineer of track on the Northern Pacific at St. Paul, Minn., has been appointed division roadmaster on the Tacoma division with headquarters at Tacoma, Wash. Mr. Anderson succeeds **G. W. Cookson,** who has retired. **J. F. Mootz,** branch line roadmaster at Pasco, Wash., has been promoted to district roadmaster, replacing **B. E. Nutley,** who is retiring as district roadmaster at Yakima, Wash. Mr. Mootz will continue to make his headquarters at Pasco. **J. W. Kanan,** assistant roadmaster on the Tacoma division, replaces Mr. Mootz. **O. M. Standal,** branch line roadmaster at Jamestown, N. D., has been promoted to district roadmaster at Mandan, N. D., succeeding **R. Knutson,** who has retired. **G. G. Richardson,** assistant roadmaster of the Idaho division succeeds Mr. Standal.

M. S. McClendon, roadmaster on the Frisco at Ft. Worth, Tex., has been transferred to Tulsa, Okla. **R. D. White,** roadmaster at Chaffee, Mo., replaces Mr. McClendon. **D. L. Walker,** assistant roadmaster at Tulsa, replaces Mr. White. **E. F. Swope** has been appointed assistant roadmaster, Eastern division, north and south, with headquarters at Springfield, Mo. **C. F. Holt** has been appointed assistant roadmaster, Southwestern division, with headquarters at Tulsa. **F. L. Owen** has been appointed assistant roadmaster, Southwestern division, with headquarters at Oklahoma City, Okla. **R. H. Paschal,** supervisor of bridges and buildings for the Frisco's subsidiary line, the Alabama, Tennessee & Northern, at York, Ala., has been appointed roadmaster, with headquarters at Tennessee yard, which is now under construction.

Mr. Walker was born on September 30, 1925, at Whitesville, W. Va., and began his railway career in 1941 with the Chesapeake & Ohio as an engine-house laborer. He attended West Virginia University and graduated in 1951 with a BS degree in civil engineering. He joined the Frisco as a rodman in 1951 at Memphis, Tenn., and was made student apprentice later that year. He was promoted to assistant roadmaster in 1954 at Sherman, Tex., and was transferred to Tulsa, Okla., in 1955. He was holding this latter position at the time of his recent promotion.

G. C. Payne, whose promotion to roadmaster on the Frisco at Enid, Okla., was announced recently (*RT&S*, Feb. p. 80), was born on April 25, 1929, at Whittington, Ill. Mr. Payne graduated from the Missouri School of Mines in 1951 with a BS degree in civil engineering and entered the service of the Frisco in June of that year as a student apprentice. He

was advanced to assistant general foreman bridges and buildings—water service in January 1954 with headquarters at Tulsa, Okla., which position he held until his recent promotion to roadmaster at Enid, Okla.

Robert W. Fondren, track supervisor on the Southern at Keysville, Va., has been transferred to Charlottsville, Va. **John W. Falk, Jr.,** assistant track supervisor at Columbia, S. C., has been promoted to track supervisor at Keysville, replacing Mr. Fondren. **Albert W. Hagan,** assistant track supervisor at Jackson, Ala., has been promoted to track supervisor at that point. **Rufus E. Hulgan** has been appointed assistant track supervisor at Picayune, Miss., and **Walter F. Tolley, Jr.,** has been appointed assistant track supervisor at Branchville, S. C.

P. D. Fortino, supervisor of track on the Illinois Central at Decatur, Ill., replaces **L. E. Brault,** supervisor of track at Decatur, whose promotion to assistant to division engineer, Memphis Terminal, Memphis, Tenn., was announced recently (*RT&S,* March p. 86). **D. Beagle,** general foreman at Clinton, Ill., succeeds Mr. Fortino as supervisor of track at Decatur.

M. C. Blaser, whose promotion to general roadmaster on the Rock Island at Fairbury, Neb., was announced recently (*RT&S,* Feb. p. 80), was born on May 3, 1924, at Bern, Kan. After graduating from high school, he entered the service of the

M. C. Blaser

Rock Island as a section laborer until he entered military service where he spent three years with the army engineers. Mr. Blaser returned to the Rock Island in 1946 as an extra gang foreman and section foreman on the road's Western division. In June 1951, he was promoted to roadmaster at Limon, Colo., and was advanced to assistant train master at Fairbury on June 1, 1955. He was holding this latter position at the time of his recent promotion to general roadmaster at Fairbury.

J. M. Lucy, who has been appointed roadmaster on the Delaware & Hudson at Plattsburg, N. Y. (*RT&S,* Feb. p. 80), was born on March 14, 1898, at New

This maintenance machine *is not tied to your tracks*

One man, operating a modern Adams grader, drives via highway or along right-of-way to take care of scattered maintenance work without waiting to be transported by rail, and without need for a special crew. The grader goes to work immediately, cuts and cleans ditches, spreads ballast, widens shoulders, slopes banks, levels fill, builds grade for sidings, grades access roads, removes brush and weed growth, cleans up around stockpiles, water towers, coal docks, shops, yards, and does any other job required of it.

This modern grader is a big help in keeping maintenance up-to-date . . . fixes small troubles before they become major problems . . . saves expense and delays involved in postponement for work-train service.

Land, bordering track shoulders, can be leveled and cleaned regularly by a grader to maintain proper drainage. One man with an Adams slashes your payroll and machinery costs, saves time, eliminates sources of trouble before they develop.

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All Adams graders have 8 speeds forward, up to 25 mph (11 speeds including 3 optional "creeper" gears) and 4 in reverse to 13 mph for fast back-up in shuttle-grading.

Double-action hydraulic brakes assure quick, safe stops. When service brake on wheels is applied, brake holds transmission when it stops wheels. Machine won't slip.

Optional equipment adds to usefulness of grader. Scarifier rips out old asphalt, hard-packed dirt, roots, and stones. Dozer blade roots out brush, pushes debris off right-of-way, backfills around culverts, cleans up spillage in yards. Snow plow and wing clear and spread snow in winter.

You can find out for yourself how an Adams moves big-yardage quickly.

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Model 220 — 60 hp, 14,865 lbs.
Model 330 — 80 hp, 20,500 lbs.
Model 440 — 104 hp, 21,500 lbs.
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TraveLoader — high-speed, heavy-duty, self-propelled, belt-type loader for picking up and loading into trucks from windrows or stockpiles. 55 hp gasoline or 60 hp diesel engine, 16,800 lbs.

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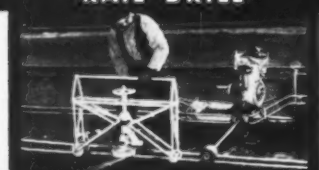

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Railway Personnel (Cont'd)

London, Conn. On October 1, 1917 he entered railway service with the Delaware & Hudson as a roadmaster's clerk at Plattsburg. On April 1, 1921, he became a work train foreman and was later advanced to extra gang foreman. On January 1, 1926, he was promoted to general foreman and subsequently held the positions of track supervisor and bridge and building supervisor. He was holding the latter position at the time of his recent promotion.

Bridge and Building

J. J. Meacham, bridge and building supervisor on the Northern Pacific at Seattle, Wash., has recently retired. **P. X. Simpson,** bridge and building supervisor at Tacoma, Wash., whose territory has been extended to include the entire Tacoma division, will assume the duties of Mr. Meacham.

C. A. Erickson, assistant engineer on the Denver & Rio Grande Western at Denver, Colo., has been promoted to supervisor of structures with headquarters at Salt Lake City, Utah. Mr. Erickson was born on July 4, 1900, at Spokane, Wash., and was graduated from Oregon State University in 1925 with a BS degree in mechanical engineering. He began his railway service with the Colorado & Southern in 1945 as an instrumentman and joined the Denver & Rio Grande Western in that capacity in 1948. He was promoted to assistant engineer in 1952 which position he held until his recent promotion.

Special

Frederick L. Monroe, engineer of drainage for the Southern Pacific at San Francisco, Calif., retired from active service on February 29.

John T. Hayden, supervisor of work equipment on the Southern at Greensboro, N. C., has been transferred to Lexington, Ky., replacing **Dexter W. Kiser,** who has been transferred to Greensboro.

Obituary

James G. Wishart, retired principal assistant engineer of the Rock Island, died March 18 at Chicago.

H. S. Ashlev, engineer maintenance of way of the Boston & Maine, Boston, Mass., died on February 12.

Orville W. Stephens, who had been appointed engineer maintenance of way of the Delaware & Hudson at Albany, N. Y. (*RT&S*, Feb. p. 79), died on March 10, after a brief illness. Mr. Stephens was born on May 29, 1900, at Carbondale, Pa. and graduated from the University of Michigan. His first service with the Delaware & Hudson occurred in 1917 after his graduation from high school. In July 1925, he became a draftsman in the engineering department of the road at Plattsburg, N. Y., and was advanced to transitman at Carbondale in February 1926. He was appointed bridge and building supervisor at that point on December 1, 1928, and was later transferred to Green Island, N. Y. On June 1, 1938,

Orville W. Stephens

Mr. Stephens was appointed track supervisor at Oneonta, N. Y., and was advanced to assistant engineer of structures at Albany in May 1941. He was promoted to assistant to chief engineer—maintenance at that point on August 16, 1949.

Association News

Bridge & Building Association

The regular spring meeting of the Executive Committee of the association was held at the Chicago Engineers' Club on March 12 with president Joseph A. Jorlett presiding. Several important items of business were discussed, including the preliminary plans for the annual convention to be held September 18-20 at the Conrad Hilton Hotel, Chicago, in conjunction with the annual meeting of the Roadmasters' Association.

Roadmasters' Association

Under the direction of President W. M. S. Dunn, the Executive Committee of the association held a meeting at the Palmer House, Chicago, on March 12, the day before the opening of the AREA convention. The meeting started in the morning and was concluded by a luncheon. The committee was concerned primarily with preliminary plans for the annual convention, to be held September 18-20 at the Conrad Hilton Hotel, Chicago. Also discussed were the status of the committee reports being prepared for presentation at the annual meeting, and the progress being made in publishing the association's 1955 Proceedings.

Track Supply Association; Bridge & Building Supply Assn.

Plans are progressing for the joint exhibition of these two associations to be held at the Coliseum, Chicago, September 17-20, in connection with the concurrent

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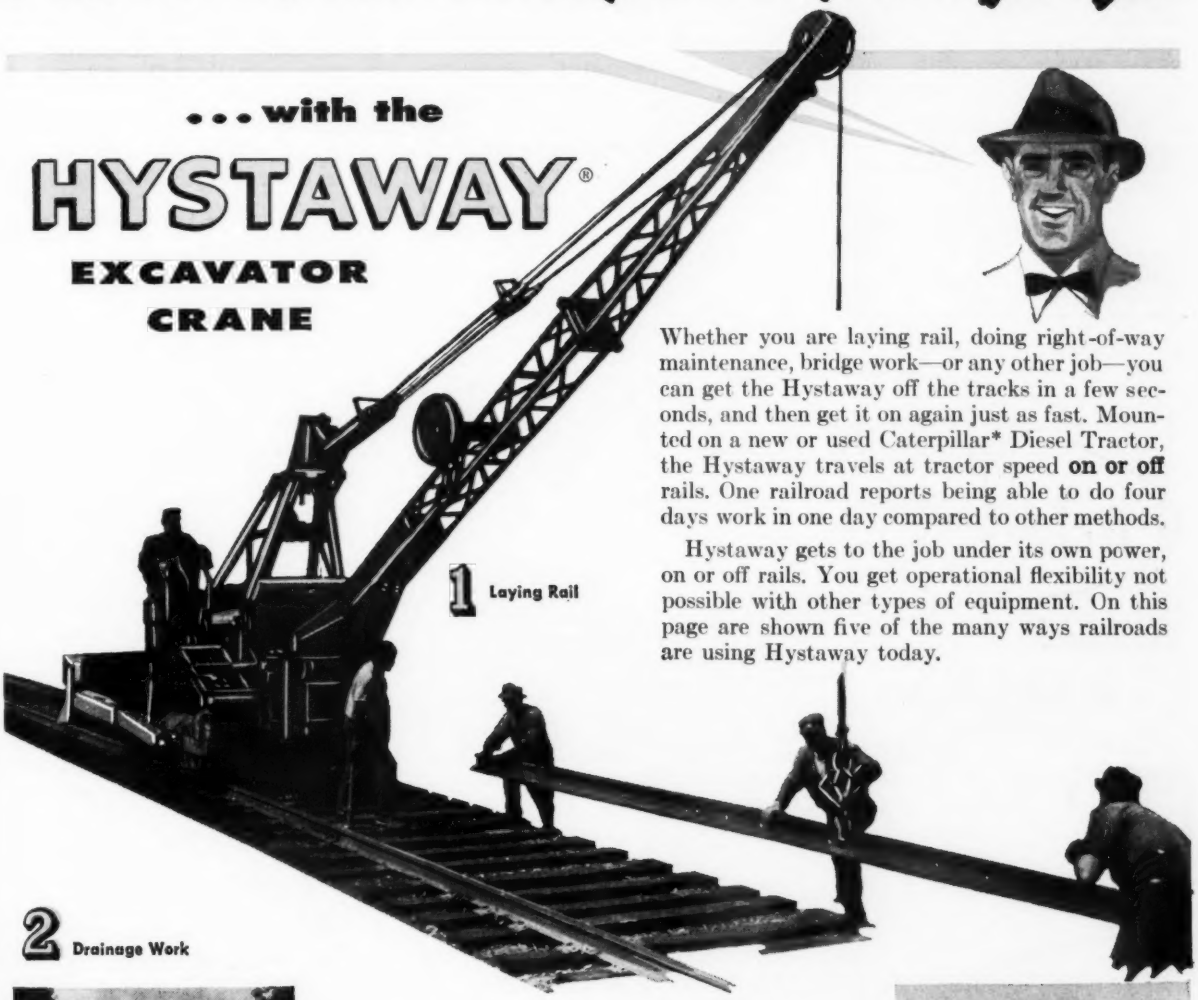
Whether you are laying rail, doing right-of-way maintenance, bridge work—or any other job—you can get the Hystaway off the tracks in a few seconds, and then get it on again just as fast. Mounted on a new or used Caterpillar* Diesel Tractor, the Hystaway travels at tractor speed **on or off** rails. One railroad reports being able to do four days work in one day compared to other methods.

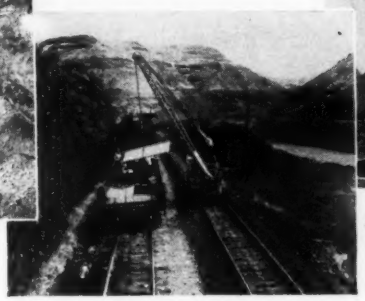
Hystaway gets to the job under its own power, on or off rails. You get operational flexibility not possible with other types of equipment. On this page are shown five of the many ways railroads are using Hystaway today.



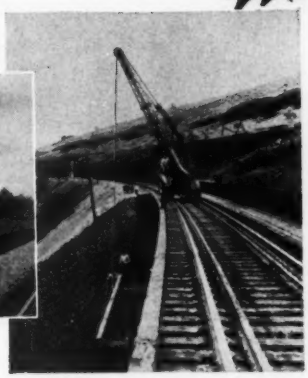
1 Laying Rail

2 Drainage Work

3 Handling Construction Material



4 Right-of-Way Maintenance



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Association News (Cont'd)

annual conventions of the Roadmasters' Association and the American Railway Bridge & Building Association. It is reported that an excellent response has been received from manufacturers. Applications up to March 8 had been received from 95 firms for a total of 250 booth spaces. Many firms are asking for larger allotments of space than used previously, and a number of new exhibitors will be included. Desirable space is still available for interested manufacturers. Inquiries should be addressed to Lewis Thomas, director of exhibits, Room 705, 59 E. Van Buren Street, Chicago 5.

Supply Trade News

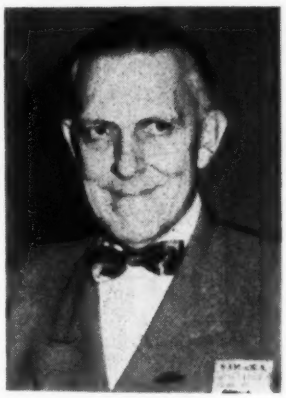
Personal

The **True Temper Corporation** has announced the appointment of the **Anderson Equipment Company,** Omaha, Neb., as its sales agent in that area. **C. R. Turner** and **H. Jack Roth** will serve the railroads with headquarters at Omaha and Denver, Colo., respectively. **W. A. Blackford** has been appointed Pacific Coast representative for the company's Railway Appliance division with headquarters at San Leandro, Calif.

W. D. Brooks, export manager, **Fairmont Railway Motors,** will devote his time exclusively to the firm's expanding export division, with headquarters at Fairmont, Minn. **Frank G. Simmons,** has been appointed Northwest District manager at St. Paul, Minn., and **Roger W. Stenzel** has been transferred from the Chicago district office to the Northwest district office.

Leslie W. Boyer has been appointed district sales manager for **Republic Creosoting Company** with headquarters at Indianapolis, Ind. Mr. Boyer is a native of Louisville, Ky., and attended both the University of Tennessee and the University of Louisville where he specialized in business, sales management and marketing. He was previously associated with the American Creosoting Company.

A. H. Whisler, superintendent maintenance equipment—system, for the Pennsylvania, has joined the **Frank Speno Railroad Ballast Cleaning Company** as assistant to the president, after more than 41 years of service with the Penn-



A. H. Whisler

sylvania. Mr. Whisler will serve in an advisory capacity to Frank Speno, Jr., president of the company, and will also have administrative and managerial duties. Mr. Whisler was instrumental in the development of the Pennsylvania's rail grinding train in 1938, an improved version of which has been built by the Speno Company for use by the railroads on a contractual basis. Mr. Whisler is a past president of the Roadmasters and Maintenance of Way Association of the Metropolitan Maintenance of Way Club of New York.

(*Continued on page* 84)

FOR SALE

Patents for two hand-operated labor-saving track tools and one track appliance. Repeat orders being received in quantity for one of the tools. Could be very profitable with moderate sales effort. Owner has other extensive interests. Address Box 456, RAILWAY TRACK & STRUCTURES, 79 West Monroe Street, Chicago 3, Illinois.

3 MEN and a BURRO...

A Real Production Team!

A Burro Crane, its operator and two men on the rail will set a fast pace for the track gang to follow. Rail gangs equipped with a Burro Crane produce more work per shift at lower cost because Burros have the pace-setting speed and efficiency that helps them keep on schedule. Equally efficient with tongs, magnet, hook, bucket or dragline, Burro Cranes handle any job in stride. Fast travel speeds get them to the job in a hurry . . . heavy draw bar pull permits hauling work train and gang.

Only Burro Cranes Have:

- Fast travel speeds . . . up to 22 MPH
- Draw Bar Pull of 7500 lbs. often eliminates need for work train or locomotive
- Elevated Boom Heels for working over high sided gondolas
- Short tail swing — will not foul adjoining track
- Low overall height — a Burro can be worked and loaded on a standard flat car

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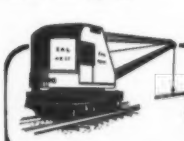

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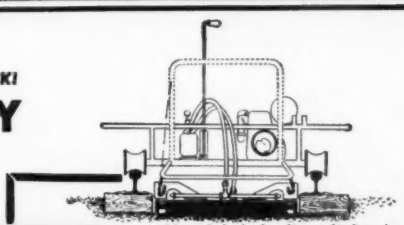
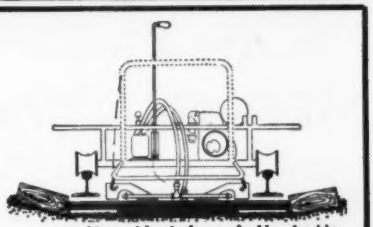
TIE-REMOVING TEAM

NOW ELIMINATES SLOW, COSTLY METHOD

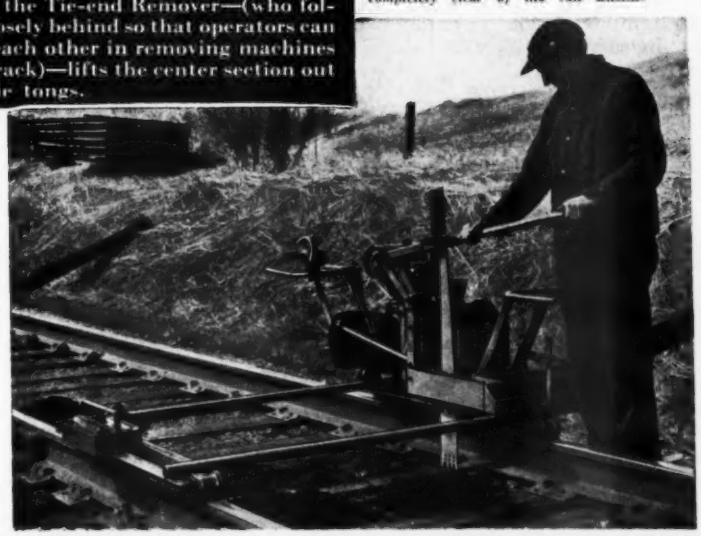


A double-ended hydraulic cylinder is then lowered into the tie bed. A simple turn of the valve moves these two pistons outward, *pushing the tie-ends completely clear of the rail—whether*



working with single or double shoulder tie plates! The crib is now open—and only the necessary amount of ballast is removed to admit the new tie.

After the tie has been cut on both sides by the WOOLERY Tie Cutter, the operator of the Tie-end Remover—(who follows closely behind so that operators can assist each other in removing machines from track)—lifts the center section out with tie tongs.



Use the WOOLERY TIE-END REMOVER in conjunction with the improved model NU WOOLERY TIE CUTTER! It's the *perfect team* for greater savings on tie renewals—and gives *smoother, safer track, too!*

For highest efficiency two Tie Cutters should be used ahead of one Tie End Remover.

The trend toward heavier rail and double shoulder tie plates has made removing tie-ends increasingly difficult. With the WOOLERY Tie-end Remover, this task can now be done *in less than a minute by one man with no more effort than that required to turn a valve!*

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When you compare the two crossings, you'll quickly see how modern Blaw-Knox Steel Grating Crossings cut track maintenance, insure smoother rides for trains, provide better traction for crossing vehicles, build public good will.

Prefabricated sections of steel grating easily installed and maintained. One section can be removed at a time for tamping tracks, cleaning ballast or removing ties . . . without holding up train or vehicle traffic.

Open mesh, self-cleaning construction permits good drainage, quick evaporation of snow and water . . . preserves life of ties.

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Supply Trade News (Cont'd)

D. B. Bishop, L. E. Flinn and **A. D. Nicolay** have been named assistant vice presidents, Railroad Department, of the **Dearborn Chemical Company.** Mr. Bishop, who was formerly district manager of the company's Pittsburgh office,

L. E. Flinn

A. D. Nicolay

D. B. Bishop

will make his headquarters in Pittsburgh, Pa. Mr. Flinn, who was manager, railroad NO-OX-ID sales, will be headquartered in Chicago. Mr. Nicolay, formerly manager, sales and service, Railroad Cleaner Department, will be headquartered in Omaha, Neb.

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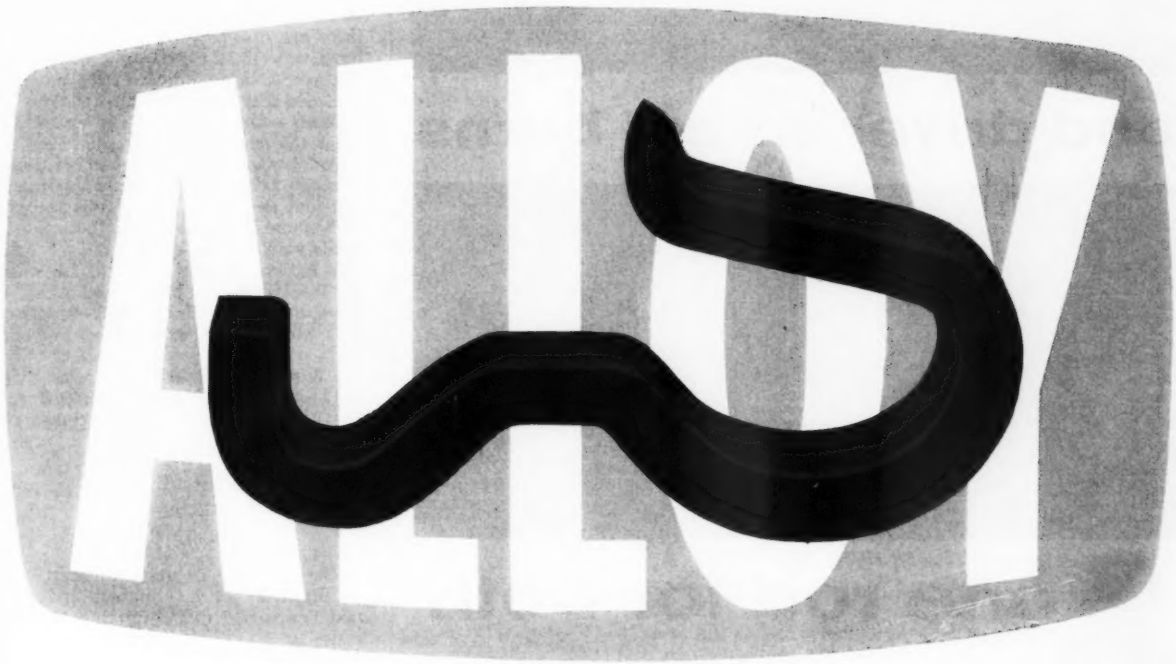


SPRING STEEL

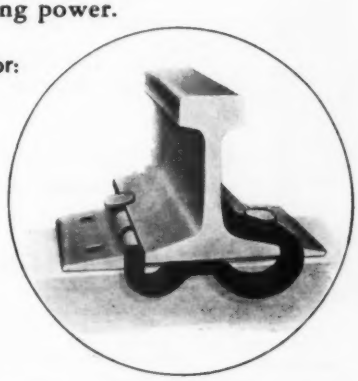
Because it makes a better rail anchor. It adds to its durability, reduces its cost of maintenance, lengthens its life, and adds to its holding power.

Other outstanding features of the Improved Gautier Rail Anchor:

It can't be overdriven.

It is easily and quickly installed or removed with maul or spike maul.

It is equally suitable for new or old rail because of its substantial take-up.

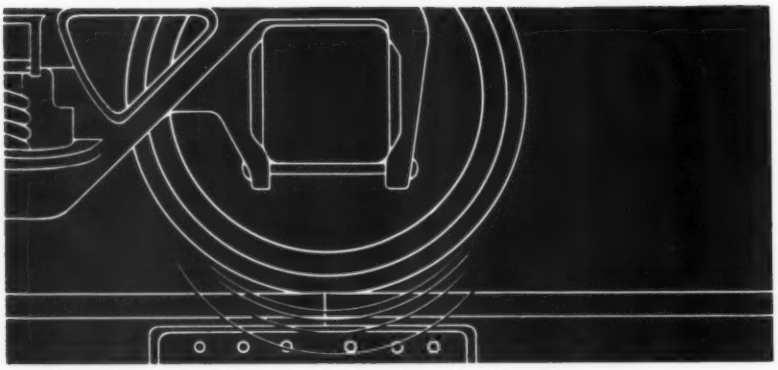


Manufactured and Sold exclusively by

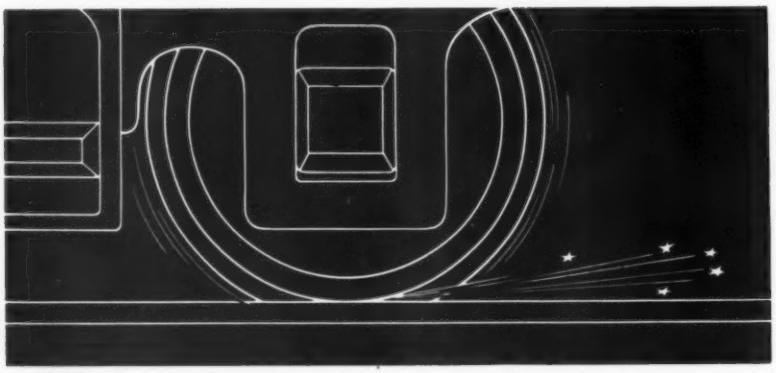
MID-WEST FORGING & MANUFACTURING COMPANY

General Office, 38 South Dearborn Street, Chicago 3, Illinois • Manufacturing Plant, Chicago Heights, Illinois

for rail end batter



and driver wheel burns



one rod for both

Airco Railroad Rod provides a single answer to these common types of rail damage. You can use it to build up battered and chipped rail ends, or, by a simple adjustment of the welding torch's oxyacetylene flame, to fill in and smooth out wheel burns. Hardness of the deposit is 251 to 350 Brinell—well within the required range for both applications. Airco Railroad Rod is standard on many major railroads, not only because it can be used for both jobs, but also because of the high quality of its deposit.

Your Airco railroad representative will be glad to arrange an actual demonstration. Why not get in touch with him today?

AT THE FRONTIERS OF PROGRESS YOU'LL FIND . . .

AIRCO®

AIR REDUCTION SALES COMPANY

A division of Air Reduction Company, Incorporated, New York 17, N. Y.

Offices in most principal cities

On the west coast — Air Reduction Pacific Company

Internationally — Airco Company International

In Cuba — Cuban Air Products Corporation

In Canada — Air Reduction Canada Limited

Products of the divisions of Air Reduction Company, Incorporated, include: **AIRCO** — industrial gases, welding and cutting equipment, and acetylenic chemicals • **PURECO** — carbon dioxide, liquid-solid ("DRY-ICE") • **OHIO** — medical gases and hospital equipment • **NATIONAL CARBIDE** — pipeline acetylene and calcium carbide • **COLTON** — polyvinyl acetates, alcohols, and other synthetic resins.

LETTERS FROM OUR READERS

Cites Some Problems of the Gang Foreman

TO THE EDITOR:

Would like to see more in your paper on the methods used by foremen to do their work and to organize their gangs.

I have run a mechanized gang for two summers now. I think they are fine but there are drawbacks. For one thing we have very little experienced help. The first year about the time we got the men broke in they were laid off. This year a different outfit was started and we had to break the men in all over again.

Another is that the high officials think you can take a gang of inexperienced men out and break all previous records with them. In my opinion, if these officials would come out on the job and stay for one week they would see what the foreman has to put up with. Also, I think they would learn more and that they would make better officers to work with.

I think they would find out that they can't learn everything out of books alone.

EXTRA GANG FOREMAN

Liked Treatment of Crossing Article

TO THE EDITOR:

The treatment in your February issue of the material on railroad crossings that I presented to the Chicago Maintenance of Way Club was most excellent. I had not expected to have it dressed up with the accompanying pictures, which by the way fitted in perfectly, and the short summation in the upper corner of the second page was perfect. You editors have a deft touch when it comes to presenting rather drab material in such a way that it becomes quite attractive and interesting.

I was quite sincere in my statement that, in my opinion, the proper maintenance of railroad crossings is too often neglected and should receive more consideration from a large portion of our maintenance-of-way personnel. I am also quite sure that your interest in publishing the article in this finest of all railway maintenance magazines will focus attention upon this important subject and materially contribute to a higher standard of maintenance of crossings throughout the country.

Again I express my sincere appreciation and assure you of my admiration and esteem for the splendid service you are rendering to all of us concerned with railroad maintenance, as well as to the industry in general.

V. C. HANNA
Chief Engineer
Terminal Railroad
Association of St. Louis

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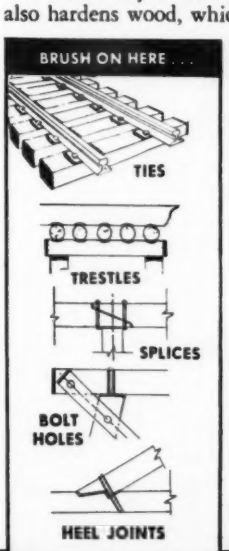
BRIDGE TIMBERS LAST LONGER COST LESS...

WHEN THEY'RE SPOT-TREATED WITH OSMOPLASTIC

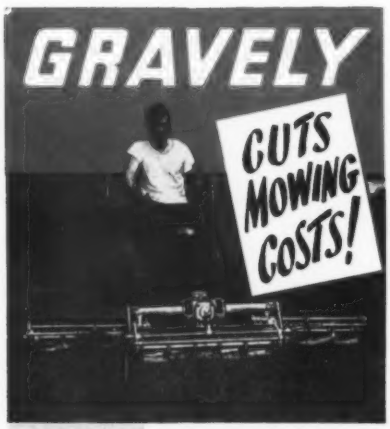
4 WAY CHEMICAL ACTION of Osmoplastic has proven itself highly effective over the years. B & B Engineers will find that this 4-way action seals out moisture and grit from the vital spots like bolt and spike holes, heel joints, splices and surfaces of stringers where they contact other members. Osmoplastic also hardens wood, which combats spike pull and reduces "plate cutting". Deep penetration by this famous wood treating product REINFORCES the preservative action of creosote in timbers, making structures last YEARS LONGER. CUTS maintenance costs drastically. So EASY to use! Just BRUSH ON where directed.



WRITE FOR FOLDER! Get all the details in this illustrated folder.

ALSO Our BRIDGE SPRAY SERVICE crews will "spray treat" complete existing structures for you. Ask us!

OSMOSE WOOD PRESERVING COMPANY
America's Biggest Manufacturer of Wood Treating Specialties
980 ELLICOTT STREET BUFFALO 9, N. Y.



ONE 5-HP GRAVELY POWERS 3 MOWING TOOLS

YOU CUT MOWING COSTS because ONE Gravely Tractor powers all the tools shown — and more — 21 in all!

NO MORE buying an engine for each tool! Instead, ONE 5-HP Gravely with tools changed quickly (only four bolts) handles the job — for the moment, or the season!

SAVE MANPOWER too, since ONE man, with ONE Gravely, can do the upkeep jobs of a crew of eight in the same time! Mechanize the upkeep jobs — get *more* done *better*, in *less* time.

30" REEL 72" GANG

30" ROTARY MOWER

42" SICKLE MOWER

48" SNOW PLOW

28" SNOW BLOWER

38" POWER BRUSH

3 SNOW REMOVAL TOOLS afford YEAR-ROUND USE, in every season — an example of Gravely's versatility.

MORE for your MONEY!

5-HP — more than twice the power of the usual power mower . . all-gear drive, two speeds forward and REVERSE . . . 21 tools available!

Push-button starter optional

WRITE . . . GET THE FACTS!

Send for 24-page Booklet, "Power vs Drudgery", that shows you how and why you get more for your money when you get Gravely.

free!

PROOF BY JOB-TEST! FREE DEMONSTRATION

WE OFFER PROOF by on-the-job demonstration. Just write for literature or FREE Demonstration today!

GRAVELY TRACTORS, INC.
BOX 42 DUNBAR, W. VA.

Helps From Manufacturers

The following compilation of literature—including pamphlets and data sheets—is offered free to railroad men by manufacturers to the railroad industry. To receive the desired information, write direct to the manufacturer.

1. CONCRETE GUNNING. 16-page 2-color catalog (156) "Airplaco Concrete Gunning Equipment" gives complete details, specifications, operating capacities (and answers often-asked questions about air placed or gunned concrete) and includes job application photos of Nucretor, Bondactor and other Airplaco concrete gunning equipment. (Write: *Air Placement Equipment Co., Dept. RTS, 1009-11 W. 24th St., Kansas City 8, Missouri*)

2. MOTOR GRADER. 16-page 2-color catalog (MS-459) features design, engineering, construction and performance story of Allis-Chalmers 50-hp. Model D Motor Graders, includes specifications and cut-away drawings of both gasoline and Diesel engine models. (Write: *Construction Machinery Div., Allis-Chalmers Manufacturing Co., Dept. RTS, Milwaukee 1, Wisc.*)

3. CRANE-EXCAVATOR. 8-page self-mailer brochure "It's a Scoop—American, The Pace-Setter in Crane-Excavators" describes and illustrates the expanded crane-excavator line with the four new sizes; includes on-the-job photos. (Write: *American Hoist & Derrick Co., Dept. RTS, St. Paul 1, Minn.*)

4. TIE PADS. 12-page 2-color folder "A 16-Year Record of Performance Showing What The Right Tie Pads Can Do To Slash Your Costs" describes and illustrates with photos and drawings Bird Self-Sealing Tie Pads; includes list of recommended uses. (Write: *Bird & Son, Inc., Dept. RTS, East Walpole, Mass.*)

5. RADIANT HEATING. 8-page illustrated brochure "Radiant Heating Construction" describes and includes sketches of various types of radiant heating construction (sketches show position of wrought iron pipe coils in concrete slab, etc.). (Write: *A. M. Byers Co., Dept. RTS, Box 1076, Pittsburgh 30, Pa.*)

6. MATERIAL HANDLERS. 12-page 2-color booklet (D 565) "Material Handlers At Work" discusses answers to questions on what machines to use for specific jobs, what machines are available, and how to handle material efficiently; actual customer jobs are discussed using different machines. (Write: *Caterpillar Tractor Co., Dept. RTS, Peoria, Illinois*)

7. NUTS & BOLTS. 8-page booklet (DE 590) "Let's Talk Nuts and Bolts" discusses difference in nuts and bolts, a difference dependent on quality of material from which they are made, the type of heat-treating they receive, and the type of pre-use inspection. Folder also available on request in French, Spanish and Portuguese. (Write: *Caterpillar Tractor Co., Dept. RTS, Peoria, Illinois*)

8. OVERHEAD HANDLING. 12-page revised Engineering and Application Booklet (2008-L) describes in detail stresses developed in various type tracks used for overhead materials handling systems; problem of track peening and its solution also covered; photos show wide variety of uses. (Write: *Cleveland Tramrail Div., Cleveland Crane & Engineering Co., Dept. RTS, 8088 E. 289th St., Wickliffe, Ohio*)

9. MOTORS & EQUIPMENT. 12-page publication (GEA-6068) covers the complete line of fractional horsepower direct-current motors and equipment for direct application and built-in use; includes typical applications, product features, ratings, specifications. (Write: *General Electric, Dept. RTS, Schenectady 5, N. Y.*)

10. MOTOR GRADER. 16-page bulletin (HWG-521) and complete specification sheets on the two new motor graders (102-hp. 6-D and 140-hp. 7-D); special historical section shows world's first motor grader and first grader with hydraulic controls; includes in-action photos as well as the complete H-W line. (Write: *Huber-Warco Co., Dept. RTS, Marion, Ohio*)

11. WELDING ELECTRODES. 8-page pocket-size folder (2876) "Your Source of Supply for Ni-Rod and Ni-Rod 55" lists names of Ni-Rod suppliers. (Write: *International Nickel Co., Dept. RTS, 67 Wall St., New York 5*)

12. STEEL FLOOR ARMOR. Illustrated booklet "Hexteel & Floorsteel Steel Floor Armor" describes the many uses of steel floor armor; shows application and installation of Hexteel heavy duty floor armor and Floorsteel flexible type floor armor. (Write: *Klemp Metal Grating Corp., Dept. KL (RTS), 6601 S. Melvina Ave., Chicago 38*)

13. WELDERS. 8-page 2-color punched folder (SB-1337-3) describes, illustrates and gives specifications on Lincoln Shield-Arc Engine-Driven Welders; includes on-the-job photos and standard accessory sets. (Write: *Lincoln Electric Co., Dept. RTS, Cleveland 17, Ohio*)

14. VALVES. 3-color circular (603) describes, illustrates and gives dimensions on the Lunkenheimer new line of five bronze solder-end valves (particularly suitable for underground water lines, heating and air conditioning systems, commercial structures). (Write: *Lunkenheimer Co., Dept. RTS, Box 360, Cincinnati 14, Ohio*)

15. STEAM CLEANER. 4-page folder (876) lists the 175 Malsbary steam cleaner service centers in the U.S. and Canada, with their addresses; includes details on the Malsbary Service Plan. Also available, form 890 lists Malsbary district and regional sales managers. (Write: *Malsbary Manufacturing Co., Dept. RTS, 845-92nd Ave., Oakland 3, Calif.*)

16. HYDRAULIC PUMPS. Two-color bulletin (143) describes the three pump sizes of Hydreco 3600 Series gear-type hydraulic pumps (for large industrial and mobile equipment applications); cut-away drawings show mechanical features; includes selection data chart. (Write: *Kalamazoo Div. New York Air Brake Co., Dept. RTS, Kalamazoo, Mich.*)

17. PIPE NIPPLES. 16-page catalog (755) "Pipe Nipples, Bending & Fabrication" describes and illustrates with photos and charts pipe nipples; for every class, there are list prices, carton quantities, weights and specifications. (Write: *Pittsburgh Nipple Works, Dept. RTS, 1455 Spring Garden Ave., Pittsburgh 12, Pa.*)

18. RUST PREVENTION. 28-page booklet (255) "Stop Rust With Rust-Oleum" describes rust prevention and illustrates Rust-Oleum uses and applications; includes 102 color chips showing many Rust-Oleum colors available in Primers, Short Oil Type Coatings, etc. (Write: *Rust-Oleum Corp., Dept. RTS, 2799 Oakton Street, Evanston, Illinois*)

The Columbia, Newberry & Laurens Railroad

USES A D6 AND NO. 60 SCRAPER TO REDUCE A CURVE

Two miles north of Little Mountain, S. C., the Columbia, Newberry & Laurens Railroad had a sharp curve. Then a Cat* D6 Tractor and No. 60 Scraper moved in and took out the worst of it.

The efficient big yellow team cut down grade to make it possible to move the track. Then the hard-working off-track rig filled in the old cut. In the past year, the railroad has used this same productive team to build 18 miles of roadbed.

And now the work life of these fast-moving Caterpillar units is greater than ever. The D6 is equipped with the exclusive Caterpillar oil clutch requiring very little adjustment. Clutch plates, cooled and lubricated with oil, give far longer wear. Maintenance costs are reduced. Work life prolonged.

The No. 60 Scraper has a capacity of 7 cubic yards struck, 9 cubic yards heaped. Now many models of Caterpillar-built Scrapers have been given the new, efficient LOWBOWL design which enables you to load more material in less time. All down the Caterpillar off-track line, new models have been created and new refinements added to increase production and dependability.

Now it's more important than ever to see your Caterpillar Dealer. He has virtually an entire new line of money-saving off-track equipment to demonstrate—on your job.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

NAME THE DATE... YOUR DEALER WILL DEMONSTRATE

INSPECTION after nine years' service shows original protection given by Texaco Rail Joint Lubrication still excellent. Joint could have gone many more years before re-lubrication was really necessary. Note the absence of rust on bolts, the substantial quantity of *Texaco 904 Grease* still on fishing surfaces, the good condition of *Texaco 1407 Plastic Plugs.*

HOW A TEXACO-LUBRICATED RAIL JOINT LOOKS AFTER NINE YEARS' SERVICE

HERE IS PROOF that Texaco Rail Joint Lubrication—a single application of *Texaco 904 Grease,* with *Texaco 1407 Plastic Plugs* to seal the joint ends—is your best bet for long-lasting protection.

Texaco Rail Joint Lubrication also offers the advantage of quick and easy application, and the work can be done under traffic without taking down the joint.

More than 4,000 track miles (over one million rail joints) of U. S. railroads are protected by *Texaco 904 Grease.* And the number is increasing steadily.

Why not use this proven method of substantially reducing this track maintenance cost? For full information, call the nearest Railway Sales Office in New York, Chicago, San Francisco, St. Paul, St. Louis or Atlanta. Or write:

☆ ☆ ☆

The Texas Company, *Railway Sales Division,* 135 East 42nd St., New York 17, New York.

TEXACO **TEXACO Rail Joint Lubrication**

TUNE IN: TEXACO STAR THEATER starring JIMMY DURANTE on TV Sat. nights. METROPOLITAN OPERA radio broadcasts Sat. afternoons.